2018

Open Innovation in Small and Medium-Sized Enterprises: Executive and Employee Perception of Processes and Receptiveness

Bethany A. Davidson
Antioch University - PhD Program in Leadership and Change

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Bethany A. Davidson

ORCID Scholar ID# 0000-0001-9161-4312

A Dissertation

Submitted to the Ph.D. in Leadership and Change Program of Antioch University

in partial fulfillment for the degree of

Doctor of Philosophy

July, 2018

This dissertation has been approved in partial fulfillment of the requirements for the degree of Ph.D. in Leadership and Change, Graduate School of Leadership and Change, Antioch University.

Dissertation Committee

- Lize Booysen, DBL, Committee Chair
- Carol Baron, Ph.D., Committee Member
- Joseph P. Lakatos. LL.M, Committee Member

Acknowledgements

No one completes a Ph.D. alone. By its nature, a Ph.D. is founded on the work of others—those who also had questions they sought to answer and, in that search, laid the groundwork for future research. To those who have come before me, I thank you. I also wish to thank and express my gratitude to the following:

To my dissertation committee Dr. Lize Booysen, Dr. Carol Baron, and Dr. Joseph Lakatos. Your support, guidance, patience, and unflagging belief in me made this possible.

To the Antioch University Ph.D. in Leadership and Change faculty who guided and supported me through the early parts of this journey and who continued to support and cheer me on as I moved through the process. It really does take a village. With special thanks to Dr. Jon Wergin who saw something in me during my interview that made him recommend me for entrance to the program.

To my Cohort 8 teammates who supported and challenged me and made me want to be better as a scholar, practitioner, and person. You taught me so much just by being yourselves and by sharing your personal experiences and insight with me.

To Dr. Vareska van de Vrande and Dr. Oliver Gassmann for their assistance with developing my survey.

To my graduate school professors who convinced me to consider a future it never occurred to me was an option. In particular, Dr. Steve Henson who asked the question "Have you ever considered getting a Ph.D.?" and provided the encouragement and information that started it all.

To Drs. Jim and JoAnn Carland who gave me the opportunity to teach and facilitate the dreams of others in a new way.

To the families of my birth and of my heart, thank you for your love and support. To my mother Eileen Bunn for her love and for grounding me in the knowledge of who I am. To the family of my heart: mother Judy Weber, sisters Mary Ellen, Sara, Nancy, and Denise, and the nieces and nephews who I do not get to see often enough. Your embracing me as one of the family and your acceptance and love means more to me than I can possibly say.

To my dearest friends for life Mary Ellen Weber, Lynn Winter, and Jeff McNair. You have always been there for me and your love and ability to make me laugh and make everything better warms my heart every day. You held fast in the belief that I would complete my Ph.D. and sustained my ability to believe it as well. I appreciate you letting me cry on your shoulders when the stress was just too much to take that day.

To Professor Debra Burke and Brennan Burke who have taken being good friends and neighbors to another level. You have been my constant cheering section, celebrating the milestones with me, and supporting the non-Ph.D. portion of my life as well.

To Dr. Bob Carton and my former colleagues at Western Carolina University who supported and encouraged my pursuit of a Ph.D. and who encouraged me to say no to those things that would interfere with my goal; a lesson it took me far too long to learn.

To Dr. Regis Gillman who had every confidence in me that I could do it and advocated that earning a Ph.D. was the right choice for me. I appreciate your continued support throughout this journey.

To Dr. Leonard Cruz, Dr. Laurie Hamilton, and Dr. Jessica Ange whose work with me made healing and finishing my Ph.D. possible.

There are many others who have generously provided support, guidance, motivation, and a belief in me that made this dissertation possible. While I may not have mentioned you by

name, you are remembered, loved, and thought of with gratitude. I have been very blessed to have so many wonderful people in my life and I appreciate each and every one of you.

Dedication

I dedicate this to anyone who has suffered a traumatic brain injury and wondered if and how they would ever be able to recover and move forward in their life. You will never be the person that you were, but that doesn't mean you can't be more and have a future that exceeds anything you ever dreamed possible.

Abstract

This study explored open innovation activities in small and medium-sized enterprises. Most open innovation research to date has focused on large organizations; however, large organizations engage in open innovation is very different from that of small and medium-size enterprises. The embedded design, mixed methods study utilized a survey delivered to owners or other organizational executives and employees of small and medium-size enterprises to solicit information regarding whether small and medium-size enterprises are actively engaging in inbound open innovation activities, their motivation for engaging in open innovation, and the sources they are utilizing to obtain new ideas for products and services. The survey also solicited the perception of executives and employees as to organizational processes for open innovation and their organization's receptiveness to open innovation and employee ideas and compared the responses. Qualitative questions elicited employees' experiences with regards to idea sharing within their organization. The majority of the 320 participants, almost evenly split between executives and employees, were recruited using Amazon's® Mechanical Turk® platform. Results were analyzed using independent-samples t-tests and Chi-Square analysis. The study found that 91.2% of small and medium-size enterprises engaged in some level of open innovation activity. Executives from small and medium-size enterprises engaging in open innovation reported that 97.6% had open innovation formally or informally as part of their organization's business model and that they utilized employees as an important source of ideas. The results of this study exploring the presence of processes to facilitate open innovation and receptiveness to employee ideas in small and medium-size enterprises, found a clear disconnect between executive and employee perception of what organizations are communicating and doing with executives perceiving a greater level of support for open innovation than employees. This

study provides some insight into how small and medium-size enterprises and leaders can add value to the organization by improving their organization's engagement in open innovation and encouraging one of their most important sources of ideas for new and improved products, services, and processes—employees. This dissertation is available in open access at AURA: Antioch University Repository and Archive, http://aura.antioch.edu/, and OhioLINK ETD Center, https://etd.ohiolink.edu/.

Keywords: Open Innovation, Small and Medium Sized Enterprises, SME, Perception, Leadership, Executive, Receptiveness, Mixed-Methods, Employee Innovation, Idea Sharing, New Product Development, Business Model

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Chapter I: Introduction

This introduction briefly discusses some of the available research on creativity, innovation, open innovation, and small and medium enterprises to be discussed in greater depth in Chapter II. Despite a large body of literature addressing innovation, in particular leadership and organizational factors fostering innovation, there are still many gaps in our understanding of how innovation happens within organizations and how open innovation occurs in small- and medium-sized enterprises (SMEs).

Organizational innovation begins with individual creativity and depends upon employees sharing their ideas within the organization. The creativity and innovation resources available to organizations are not and should not be closed systems. Traditionally, organizations have relied on a closed system where idea generation is limited to employees who are part of the formal research and development or new product development processes (van de Vrande, de Jong, Vanhaverbeke, & Rochemont, 2009). Closed innovation systems exclude non-research and development (non-R&D) employees—such as frontline employees who have direct contact with customers—from the innovation process. This can have a significant impact on an organization's ability to generate value for customers because it is the frontline employees who are in the best position to understand customers, identify customer needs and wants, and to obtain information from customers as to how products and services can be innovated to better satisfy customers; therefore, capturing their ideas and knowledge is vital to organizational innovation efforts (Selden & MacMillan, 2006). It is important to understand what happens to employee ideas, customer knowledge, and organizational innovation efforts if there is no process in place to capture or implement them. What kind of organizational barriers might exist that prevent SMEs from actively soliciting ideas from employees, implementing internal innovations,

or effectively utilizing open innovation in their innovation efforts and what barriers may exist that are preventing employees from sharing their ideas?

Open innovation is a model for how organizations can innovate by soliciting ideas from outside the organization or can benefit from their innovation activities through sharing internal intellectual property with external partners. Open innovation is defined as "the use of purposive inflows and outflows of knowledge to accelerate internal innovation and to expand the markets for external use of innovation, respectively" (Chesbrough, Vanhaverbeke, & West, 2006, p. 1).

There are three categories of open innovation: inbound, outbound, and coupled (Gassmann & Enkel, 2004). In inbound open innovation, ideas flow into the organization from partners such as customers, suppliers, crowdsourcing, competitors, universities, or governments (Brunswicker & Vanhaverbeke, 2015; Cheng & Huizingh, 2014). While some researchers consider employee involvement by non-R&D employees to be "outside" of the organization and thus partners in inbound open innovation (e.g. van de Vrande, et al., 2009) other researchers do not address non-R&D employees in their discussions of inbound open innovation neither including nor excluding non-R&D employee participation.

Outbound open innovation is the process of leveraging internally developed ideas and intellectual property to external partners through licensing, selling intellectual property, spinning off parts of an organization, alliances, and joint ventures. Coupled open innovation is when organizations engage in both inbound and outbound open innovation simultaneously (Gassmann & Enkel, 2004).

The majority of open innovation research to date has focused on large and multinational organizations (Brunswicker & van de Vrande, 2014) or particular industries, such as high-tech, while open innovation practices in small- and medium-sized organizations (SMEs) have been

largely unexplored (Brunswicker & van de Vrande, 2014; van de Vrande et al., 2009). While there is ample evidence that SMEs do engage in open innovation, how open innovation takes place in SMEs and how SME open innovation differs from large organizations remains unclear (Brunswicker & van de Vrande, 2014).

Purpose of Study

This study attempted to ascertain the source of innovative ideas in small- and medium-sized enterprises (SMEs) and how effectively those ideas are captured and implemented. The study utilized a survey delivered to owners or other organizational executives and employees to solicit information from SMEs regarding if they are purposively engaging in inbound open innovation practices as part of their innovation strategy and whether they are actively soliciting, capturing, and implementing innovative ideas generated by employees who are not normally part of the research and development process.

The survey included questions regarding the current status of new and improved product and service development activities in SMEs, whether SMEs are actively engaging in inbound open innovation activities, why they choose to engage in open innovation, and the sources they are using to obtain new ideas.

The survey was designed to also solicit the perspective and perception of both owners/executives and employees regarding whether their organization values, welcomes and implements their ideas for innovation. Do open innovation activities within SMEs include non-R&D employees, what processes, if any, are in place to facilitate the idea sharing, and what is the perceived outcome of those sharing activities? What barriers of perception or process may be preventing employees from sharing their ideas or what organizational or leadership issues do they perceive as preventing their ideas from being welcomed or implemented? How do the

perceptions of owners/executives and employees compare regarding whether employee ideas are valued, welcomed, and implemented?

My goal was to understand how innovation informally or formally occurs in SMEs internally and within the framework of open innovation. Given that SMEs are at a disadvantage in innovation due to their size and level of resource availability and thusly are more likely to have an external and boundary-spanning (open innovation) component to their innovation practices (Brunswicker & Vanhaverbeke, 2015). I wanted to see if that boundary-spanning also occurs within the organization such that SMEs span the internal boundary between innovation activities from formal R&D employee roles to include ideas and efforts of their employees who do not have formal innovation roles. Finally, I sought to understand if the perception of frontline employees regarding whether their ideas are actively solicited and implemented by their organizations and how this perception may be consistent or inconsistent with that of organizational executives.

Research Questions

Specific research questions, and sub-questions addressed in this study include:

(1) To what extent do executives and employees in SMEs perceive that their organization engages in open innovation? Where do ideas for new or improved products and services originate in SMEs?

(2) How do executives and employees perceive their organization's receptiveness to employee ideas for new or improved products or services and what barriers does each group perceive to sharing or implementing those ideas?

(3) How do executives and employees differ in their perception of the organization's receptiveness to employee ideas and the barriers that exist to sharing and

implementing employee ideas as part of the open innovation process? How does organization size affect open innovation activities and perception of innovation processes and activities?

Study Significance

The results of this study increase our understanding of how SMEs innovate, whether organizations utilize open innovation as a formal or informal part of the innovation process, to what degree SMEs are engaged in efforts to collect and implement employee-generated ideas through the mechanism of open innovation. The study also provides insight regarding the role that employees in SMEs play in the organizational innovation process and identifies perceptual and process barriers that may be preventing effective collection and implementation of employee ideas within SMEs through comparison of executive and employee perceptions

This study adds to the body of knowledge regarding open innovation utilization in SMEs, the mechanisms utilized to collect ideas, the role of the organization's non-R&D employees in the open innovation process, and to identify organizational structure, process, or perceptual (executive or employee) barriers that are preventing organizations from capturing and implementing employee ideas or ideas generated through inbound open innovation to increase efficiency, reduce costs, improve existing products or services, or from proposing new products or services.

I believe this dissertation topic approached the contribution of individual employees to a company's innovation efforts from a new perspective, generated data increasing understanding of open innovation utilization and success in SMEs and provided valuable information that can be used in practice.

Positioning

My research question is drawn directly from my daily practice. As a former assistant professor of entrepreneurship, I taught two or three entrepreneurial innovation and creativity courses each semester for twelve years. In the classroom, I worked diligently to create a culture where students felt comfortable sharing their ideas with their peers, yet few students were willing to share their ideas or thoughts openly in the classroom. It was not for a lack of ideas; students were required to turn in weekly discussion papers commenting on the week's materials and those papers were rich with student ideas and reflections on the week's topics. The fact that my students were unwilling to share their ideas in such a low-risk environment, particularly when students were required to generate product and service ideas as part of the course requirements, led me to question whether a similar phenomenon was occurring in the workplace and why.

Frontline employees are in what I perceive to also be a low-risk situation related to sharing ideas; it makes sense for organizations to encourage and expect those individuals to be gathering information from customers and sharing that information with others in the organization. I perceive them to be the workplace equivalent of students in the classroom. However, there seems to be a biased view in organizations that employees who are not formally part of the research and development process do not have anything to contribute to an organization beyond completing their functional responsibilities.

I have seen a similar bias in my consulting work with small businesses; entrepreneurs are often unwilling to entertain ideas generated by others because the entrepreneur believes that their vision is the best or right vision and they are unwilling to change or to consider that there may be another or better way to do something or that their idea, as is, has issues. I have seen many small businesses that failed because the entrepreneur would not take any advice that conflicted with

their own vision and know of many employees who left a small business because their input was dismissed because the entrepreneur could not see beyond their own viewpoint.

My goal at the end of my dissertation research was to understand the process for how innovation occurs in SMEs and what barriers exist that may be preventing effective innovation.

Limitations and Delimitations

The study was confined to a segment of small – and medium-sized for-profit organizations who may or may not engage in open innovation practices that involve both external partners and their non-R&D employees and may not be generalizable to other types or sizes of organization. Conversely, the narrowness of the population being studied implies that this population is somehow different from the larger population of 'all organizations'; there is the potential for the data to show that this population is not significantly different from the rest of the for-profit organization population.

Organizations commonly viewed as innovative have cultures and structures that are different from a 'typical' or 'traditional' business organization (O'Reilly & Tushman, 2004). Mumford and Licuanan (2004) raised the issue that we may not be able to generalize existing models for leadership effectiveness in a 'typical' organizational setting to leading in creative ventures. This study faced the same issue of attempting to generalize a set of results from a narrow sample of the organizational population

Definitions of Key Terms

- *Innovation* is defined as "the embodiment, combination, or synthesis of knowledge in original, relevant, valued new products, processes, or services" (Luecke, 2003, p. 2).

- *Open innovation* is “the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and to expand the markets for external use of innovation, respectively” (Chesbrough, 2006, p.1).
- *Inbound open innovation* was defined using a derivative definition of open innovation for the purpose of this study for participant clarity and ease of example illustration. In the survey, inbound open innovation is defined as: an organization utilizing resources other than a formal internal research and development process to generate ideas for new or improved products and services. For example, outside ideas can come from: customers, suppliers, crowdsourcing (e.g. social media posts), universities, and government entities, as well as employees who are not typically involved in research and new product development.
- *Small- and Medium-Sized Enterprise* for the purpose of this study is defined using the Organization for Economic Co-operation and Development’s (OECD) definition which identifies any enterprise with fewer than 250 employees as a small- or medium-sized enterprise and one with more than 250 employees as a large business (OECD, 2018). OECD is an international organization of 35-member countries, including the U.S., which collects data, sets standards, and promotes policies related to economic, social, and environmental change (OECD, 2017). For the purposes of this dissertation, analyses including organization size were conducted based on two size categories one to 249 employees and 250 or more employees so that results could be more easily compared to extant research utilizing OECD parameters while still reflecting the U.S. Small Business Administration definition of a small business which, depending upon industry, can include up to 1,500 employees (USSBA, n.d.).

- *Non-research and development (non-R&D) employees* are employees who do not, as part of their typical job expectations, have formal responsibility for innovation or new or improved product and service development (NPD).
- *Frontline employee* is defined as a manager or employee who has direct contact with an external customer who purchases the products or services the organization sells. They are on the frontline border between the organization and its customers.
- *Executive* includes the owner of or partner in an organization, those in an executive role such as C-suite officers (Chief Executive Officer, Chief Operating Officer, Chief Information Officer, etc.), and those in a managerial role within the organization. These are individuals who would have authority for the development of new products or improvements of existing products and/or for the organizational processes that are established to move ideas through an organization.
- *Perception* is defined as the "the process of becoming aware or conscious of a thing or things in general; the process of becoming aware of physical objects, phenomena, etc., through the senses; an opinion or belief" (Perception, 2005). For the purpose of this study, perception reflects what an individual believes to be true about their organization or the members of the organization.
- *Receptiveness* is defined as "readiness or ability to receive something" (Receptiveness, 2009). For the purpose of this study, receptiveness represents how open an individual perceives their organization or members of the organization to be to their ideas or suggestions.

- *A product* for the purpose of this study is defined as a tangible object (alarm clock, software package, auto part, etc.) which is sold directly to an external customer to be utilized in the customer's operations.
- A *service* is defined as a service (house cleaning, oil change, custom software development services, etc.) sold directly to a customer for their use.
- A *customer* is defined as a business, organization, or individual who purchases a product or service for their direct use. For example, a car manufacturer would purchase auto parts for use in their cars. An accounting firm might purchase accounting software for use for their clients or a business might purchase tax preparation services from the accounting firm. For businesses selling to other businesses, the definition of customer requires the purchasing business to use the product or service directly in their own operations.

Outline of Succeeding Chapters

This chapter introduces the proposed study. Chapter II is a review of the relevant literature on innovation and open innovation including definitions and major themes. Chapter III explains the research design including methodology and data collection methods for the qualitative and quantitative methods used, and a description of data analysis methods. Chapter IV provides the results of the qualitative and quantitative pieces of the study, evidence of quality, and an interpretation of the results. Chapter V includes a brief summary of results, an interpretation of results, implications for leadership practice, recommendations for further study, and conclusion.

Chapter II: Literature Review

Introduction

One of the hottest topics of discussion in business today is the leadership and management of innovation. A report entitled *A Strategy for American Innovation: Securing Our Economic Growth and Prosperity* (National Economic Council et al., 2011) published by the U.S. White House begins with a quote from former U.S. President Barack Obama on the importance of innovation to the nation:

> For in a global economy, the key to our prosperity will never be to compete by paying our workers less or building cheaper, lower-quality products. That's not our advantage. The key to our success – as it has always been – will be to compete by developing new products, by generating new industries, by maintaining our role as the world's engine of scientific discovery and technological innovation. It's absolutely essential to our future. (p. 7)

Luecke (2003) defined innovation as *"*the embodiment, combination, or synthesis of knowledge in original, relevant, valued new products, processes, or services" (p. 2). Innovation can occur within every organization regardless of organizational size, for-profit or not-for profit status, industry, product or service focus, and purpose of the innovation (creating brand new products, services, technology, etc. or improving existing operations). The products we use, leadership, training, education, health care, sports, or the flow of cars into the parking lot in the morning are all open to innovation; however, innovation is typically associated with new product development.

There is widespread agreement that innovation is vital if businesses want to remain competitive in today's rapidly changing global marketplace (e.g. Bhat, 2010; Musteen, Barker, & Baeton, 2010; Shipton, Fay, West, Patterson, & Birdi, 2005). Innovation contributes to organizational success (Aragón-Correa, Garcia-Morales, & Cordón-Pozo, 2007) and is important

for organizations intending to: effectively compete in the rapidly evolving global marketplace (Damanpour & Schneider, 2006; Hage, 1999; Jung, Chow, & Wu, 2003; Mumford, Scott, Gaddis, & Strange, 2002), meet the needs and wants of existing and emerging markets (Klijn & Tomic, 2010), and to capitalize on opportunities (Yukl & Lepsinger, 2006). This focus on innovation has led to a significant increase in research using the term "innovation" in the title or keyword across all disciplines and areas of research. However, while there is a significant amount of literature discussing innovation, given the broad usage of the term "innovation", there are few areas where the research can be considered definitive.

Innovation research is still an emerging field full of contradiction and complexity. The situational nature and large number of variables involved in the innovation process resists researchers' attempts to identify the one or more universal variables that drive innovative activities within organizations regardless of context. The great challenge of innovation research is that there is no, one, universally agreed upon definition of innovation or organizational innovation utilized by all researchers or disciplines. Generalizing the results of innovation research is complicated by:

- several different types of innovation (product, process, service, marketing, technology, administrative, and etc.);
- a variety of models of the innovation process;
- conflicting or ambiguous research results on the individual, organizational, or leadership activities that best support innovation;
- and the varying contexts in which innovation is discussed (new product development, adopting new innovations within an organization, consumers' willingness to buy (adopt) new products and services, and etc.).

A review of innovation literature clearly shows that researchers are not using a common definition or context for innovation in their research. This shifting context utilized to frame innovation research along with the lack of a universal definition for innovation often leads to conflicting or uncertain research results.

Innovation research lies along three main themes organizational innovation, innovation leadership, and individual-level innovation. Innovation research's primary focus is on identifying the individual and organizational factors that foster individual creativity or support organizational innovation. Research into individual and organizational factors has included characteristics of the individual (Hammond, Neff, Farr, Schwall, & Zhao, 2011); the role of leaders (Mumford et al., 2002; Paulsen, Maldonado, Callan, & Ayoko, 2009; Shipton et al., 2005; Stenmark, Shipman & Mumford, 2011); the effect of leadership or management on organizational or employee innovation capability (Charbonnier-Voirin, El Akremi, & Vandenberghe, 2010; Gilley, Dixon, & Gilley, 2008; Horng, Hu, Hong, & Lin, 2011; Krause, 2004; Lee & Kelley, 2008; Michaelis, Stegmaier, & Sontage, 2009; Michaelis, Stegmaier, & Sontage, 2010; Musteen et al., 2010; Paulsen et al., 2009; Wang & Casimir, 2007); organizational innovation processes (Desouza et al., 2009); individual and organizational mechanisms supporting innovation (Bharadwaj & Menon, 2000); and organizational culture (Dombrowski et al., 2007).

Innovation research is situational and context specific as each organization's resources, strategy, and competitive environment are different. Innovation researchers have used a variety of contexts to frame their discussion including innovation strategy, stages of innovation, or the context provided by the industry or organization being addressed. The research question for this study is grounded in the context of stage of innovation; specifically, I am looking at the ideation

stage when issues or problems are identified and then ideas generated to address or solve the issues and problems. A discussion of stage of innovation is included to clarify the context in which the idea sharing activities that are the focus of this study should be occurring.

Frontline employee involvement in innovation is important to organizational innovation as those are the employees most frequently interacting with and receiving direct feedback on product, services, or future needs from customers (Selden & MacMillan, 2006). Other employees, such as shop floor employees involved in manufacturing, who are not formally part of the research and development process are also important contributors in the innovation process as they have a unique perspective on the organization's operations (Axtell, Holman, & Wall, 2006). However, it is unclear if SMEs can effectively collect ideas, whether organizations can leverage the ideas of frontline and non-R&D employees, and if their open innovation efforts are successful.

Chapter II provides an overview of several primary areas of general innovation research: innovation definitions, stage of innovation, organizational innovation, innovation leadership, individual-level innovation, creativity and idea generation. One of the fastest growing areas of innovation research and the focus of this study is open innovation. Chapter II also provides a discussion of open innovation as well as a discussion of open innovation in SMEs which are the population of organizations surveyed.

Research Strategy

A multi-strategy search was used to identify appropriate literature including:

(1) Subject search in bibliographic indexes such as ABI Inform, Academic Search Premier, Business Source Complete, and PsychInfo.

(2) Mining citation lists from articles identified in index searches as well as literature reviews and books.

(3) Citation search in Web of Science, Google Scholar, Emerald, and ScienceDirect.

(4) Forward citation search in Web of Science, Google Scholar, Emerald, and ScienceDirect.

(5) Search for relevant dissertations and review their citation lists for additional references.

After completing the database searches, I narrowed the pool of potential articles from the Business Source Complete and ABI Inform through a review of the titles and brief article information; highlighting those that seemed promising and obtaining their abstracts. I then reviewed all the abstracts and selected the articles that had the most promise for addressing my research question. Once that step was completed I began to review the citation lists from the articles narrowed in my research to see if other suitable articles were available and obtained any that looked appropriate based on their abstracts (step 2).

I continued the search with citation and future citation searches in a variety of databases on multiple occasions. Table 2.1 provides a list of the key search terms used in the database searches.

Table 2.1

Databases Searched and Search Terms Used

Database	Search Terms			
	Innovation	Open Innovation	Small- and Medium Enterprises (SMEs)	Peer Reviewed
PsychInfo	Innovate or Innovation or Creativity	Open Innovation or Inbound Open Innovation or Employee Innovation or Idea Sharing	New Product Development and SME or SME and Open Innovation	Journal or Peer Reviewed or Journal or Peer-Reviewed Status unknown
ABS ABI Inform Academic Search Premier Business Source Complete Web of Science ScienceDirect Emerald ETD	Innovat* or Creativ*	Open Innovation or Inbound Open Innovation or Employee Innovation or Idea Sharing	New Product Development and SME or SME and Open Innovation	Peer-Reviewed Journals

Overview of Innovation Research

Innovation defined. The term "innovation" has been applied in the literature to describe a wide variety of activities including the introduction of new products, services, or technologies and the improvement of existing products, services, or processes. The term innovation has also been defined based on the scale and scope of change. Some researchers have defined innovation as a small change to a product such as a small design change while other researchers believe that the term should be reserved for large-scale or world-changing developments such as cloud computing.

The definition of innovation utilized in research is typically tailored to fit the context of the research for which the definition was provided. Given the diverse contexts in which innovation can occur and the diverse perspectives—creativity, organizational factors,

technology, and change—of innovation research, it is not surprising that there are a variety of definitions. This difference of opinion on what constitutes innovation may be viewed as a problem arising from the fact that there are many different types of innovation (product, process, service) and that situational and other variables (i.e. leadership) that make it difficult to study innovation as a universal phenomenon; this may account for inconsistent results seen in prior innovation research (Friedrich, Mumford, Vessey, Beeler, & Eubanks, 2010).

Damanpour and Schneider (2006) employ a basic definition of innovation widely utilized in innovation literature that defines innovation as "…the creation or adoption of new ideas" (p. 216). Luecke (2003) defined innovation as "the embodiment, combination, or synthesis of knowledge in original, relevant, valued new products, processes, or services" (p. 2). Bhat (2010) took a broader view to bring in the development of a new market as a component of the definition and moved it beyond the idea of new products or ideas. Kontoghiorghes, Awbrey, and Feurig (2005) defined innovation as "…the extent to which the organization can introduce new products or services quickly and easily" (p. 190).

Researchers have also defined innovation in the context of the organization such as an organization's ability to align its needs with external needs (Zain, Richardson, & Adam, 2002), an organization's ability to introduce new products (Kontoghiorghes et al., 2005) and how successfully those products were introduced in the marketplace (Gumusluoğlu & Ilsev, 2009a). The introduction of new, or changes in existing technology, is also utilized to define innovation (Medina, Lavado, & Cabrera, 2005). Innovation has also been defined by researchers as equal to or required for change; for example, Woodman, Sawyer, and Griffin (1993) view innovation as a subset of organizational change as do Collinson and Wilson (2006) and Krause (2004) who

defined innovation as "…all intentional results of action (products or processes) that bring about perceived changes within the organization" (p. 79).

The definition of innovation that will inform this study is that provided by Luecke (2003) "the embodiment, combination, or synthesis of knowledge in original, relevant, valued new products, processes, or services" (p. 2).

Creativity. Innovation and creativity are often discussed together as creativity is the foundation of innovation. There is general agreement that the ability of an organization to innovate is dependent upon individual creativity (Amabile, Conti, Coon, Lazenby, & Herron, 19961996; Amabile, 1988; Bassett-Jones, 2005; Gumusluoğlu & Ilsev, 2009a; Klijn & Tomic, 2010) as it is the creativity of individuals that generates the new ideas required for organizational innovation (Amabile et al, 1996; Bassett-Jones, 2005; Gumusluoğlu & Ilsev, 2009b; Klijn & Tomic, 2010; Shalley & Gilson, 2004). Researchers typically make a distinction between creativity and innovation in their discussions, identifying creativity as a stage where ideas are generated and innovation as the implementation of those ideas (Amabile et al., 1996; Rank, Pace, & Frese, 2004). Creativity is typically viewed as grounded in the individual while innovation requires an organizational process building on individual creativity (Bharadwaj & Menon, 2000).

Distinct definitions for creativity and innovation serve to separate the activities of creativity and innovation into discrete domains while at the same time making the link and dependency between them clear—creativity does not equal innovation, however, it must be present for innovation to occur (Amabile et al., 1996; Woodman et al., 1993). Creativity is often differentiated from innovation with creativity defined as inherently "novel" (Amabile et al., 1996); however, depending upon the definition of innovation being used, a product or process

produced through innovation could simply be an adaptation to a preexisting product or process (Rank et al., 2004; Woodman et al., 1993).

Discussions of innovation in practice is also often focused on the need for individuals in an organization to be "creative" as employee creativity significantly influences organizational innovation (Gumusluoğlu & Ilsev, 2009b) and, therefore, it is of vital importance that employees are creative at work (Shalley & Gilson, 2004). IBM conducted interviews with over 1,500 CEOs from 60 countries in 2010 and found that those CEOs ranked creativity as the most important quality for a leader (Carr, 2010).

Creativity is also presented and defined in the literature as a skill or behavior that occurs across different phases of the innovation process rather than as a discrete action that launches innovation (Rank et al., 2004; Wang & Casimir, 2007; West & Farr, 1990). Creativity is seen as particularly vital to the idea generation or ideation phase (Hammond et al., 2011; Rank et al., 2004). There have been numerous studies looking at the determinants of individual-level creativity in relation to organizational innovation (Hammond et al., 2011). The levels or expressions of creativity (problem solving, new product ideas, process improvement, etc.) required for an innovation is contextual and dependent upon the type of innovation, the employees' job position, and the firm's innovation strategy (Shalley & Gilson, 2004); therefore, the practical path by which creativity leads to innovation in an organization is not always straightforward and easily identifiable.

Creativity research typically reflects a holistic view of creativity (Erez & Nouri, 2010) with a universal set of skills, activities, and individual characteristics that define creativity and creative behavior; this approach, however, ignores the impact of contextual factors such as

employee perception of what will occur should they decide to share the results of their creativity, in the form of ideas, with others.

Internal or external-facing innovation. Researchers have used the same or similar terms to identify innovation processes in two different contexts: that of an organization creating innovations for use internally to improve operations or for innovations created to be utilized externally in processes, products, or services to be sold to a customer. Internal innovations—also known as process innovations—typically are designed to streamline processes, improve efficiency, or reduce costs. The customers for these internal innovations are other employees within the company; the external customer, defined as a customer paying for a product or service sold by the company, is not typically aware that the innovation occurred.

An external-facing innovation is something that directly affects the product or service that a customer is purchasing. The customer will have had the opportunity to interact with the product both pre- and post-innovation and changes to the product or service resulting from the innovation can be clearly identified. For example, a customer can identify changes in product functionality and features between the iPhone 6 and iPhone 8 or between Microsoft Windows 8 and Microsoft Windows 10. A customer purchasing a product will probably not see or be aware of an internal innovation that changes the configuration of the assembly line to make the product manufacturing process more efficient. The customer may benefit from an internal innovation by receiving a product that functions better, has higher quality, or a lower price, but they are a step further removed from the innovation process with an internal innovation.

Stage of innovation. A two-stage model for the innovation process, idea generation and implementation, is frequently, although not exclusively, used by researchers (e.g. Amabile et al.,

1996; Aragón-Correa et al., 2007; Damanpour & Schneider, 2006; Hammond et al., 2011; Krause, 2004) to frame their studies; various models propose between two and 13 steps.

The stages in the two-stage model of innovation development are typically articulated as: (1) an idea generation phase also referred to as initiation, ideation, invention, or creativity; and (2) an implementation phase referred to as implementation and/or adoption. Activities identified by researchers as taking place in the first phase are: creativity and generating solutions (Hammond et al., 2011); idea generation, screening, and concept testing (Nakata & Sivakumar, 1996); and research, idea generation, and idea codification (Williams & McGuire, 2010). Activities identified as occurring during the implementation phase of innovation development include product development, test marketing, and product launch (Nakata & Sivakumar, 1996), and the evaluation, selection, and implementation of ideas (Hammond et al., 2011).

This dissertation is grounded in the context of the stages of innovation in that the focus of the study is on an activity that bridges the gap between the idea generation and implementation stages of innovation. Axtell et al. (2000) discuss that research addressing the gap between innovation stages is lacking:

> This has meant that little attention has been given to the possibility that the factors that promote the suggestions of ideas may differ from those that encourage their implementation, or that the suggestion of ideas interacts with other factors to predict implementation. (p. 266)

It does not matter how many ideas an employee generates if the organization does not treat those ideas in such a way that they can be captured and developed further (implemented) into an innovation.

Organizational innovation. Organizations are increasingly focused on innovation as globalization, technological change, and increasing competition require new strategies (Santoro, Ferraris, Giacosa, & Giovando, 2016). It is widely accepted that organizations need to

continuously innovate to stay relevant in the marketplace. The body of research on organizational factors, such as processes, culture, and strategic orientation that may support or hinder innovation (Bhat, 2010; Boonstra & Vink, 1996; Collinson & Wilson, 2006; Kontoghiorghes et al., 2005; Shipton et al., 2005; Naranjo Valencia, Sanz Valle, & Jiménez Jiménez, 2010; Zain et al., 2002) is the second largest subset of innovation research.

Organizational innovation is dependent upon both individual efforts and organizational systems. Innovation first involves a person(s) recognizing a new opportunity and deciding to act; often through close customer contact (Kanter, 1988). Creativity is the foundation of innovation and organizational innovation is dependent upon individual creativity (Amabile, 1988) and on the organizational mechanisms created for facilitating creativity (Bharadwaj & Menon, 2000). Organizational culture and processes provide the foundation for innovation to occur by fostering individuals to develop and share ideas and providing processes for those innovative ideas to be successfully implemented.

Kanter (1988) provided a view of the organizational structure that most effectively fostered innovation "…it [innovation] is most likely to grow in organizations that have integrative structures and cultures emphasizing diversity, multiple structural linkages both inside and outside the organization, intersecting territories, collective pride and faith in people's talents, collaboration, and teamwork" (p.172).

Three of the common characteristics that are present in innovative organizations include: a shared mission and vision, communication, and incentives (Dombrowski et al., 2007). A vision or shared vision is frequently cited as a determinant of organizational innovation (e.g., Ng, 2004; Oke, Munshi, & Walumbwa, 2009; Gumusluoğlu & Ilsev, 2009b). A culture where everyone feels as if they are working towards a shared goal is more likely to foster information

sharing and collaboration (Dombrowski et al.; 2007). Ng (2004) discussing the danger of attempting innovation without a set vision writes:

> …without a clear vision, careful planning and a viable strategy, innovation efforts become sporadic and aimless, so that at the end of the day, the investment of time and financial resources in innovation activities is actually unjustified by its returns. (p. 99)

Innovation also requires information sharing within the organization and culture is a key determinant in whether that information sharing communication occurs (Dombrowski, 2007). Tan (1998) sees open communication as important for innovation "… because ideas and information are the life-blood of creativity. When communication is blocked, there will be no exchange of ideas or information within the organization, thus stifling creativity" (p. 27–28). This open communication includes communication of the vision for the organization and the direction in which its innovation efforts are headed.

Organizational expectations regarding innovation and employee's perception of those expectations impact employee behavior (Kanter, 1988). Incentives in the form of rewards and recognition or monetary awards are an important component of innovative organizations. Organizations signal the importance of innovation and expectations for employees by allocating funds (Bhat, 2010; Kanter, 1988) and supporting the development of employees' creativity-relevant skills through training and education (Amabile, 1988). Employees need support and resources such as time, authority, information, and leaders that can motivate employees to contribute (Tan, 1998). If creativity is expected it should be rewarded (Shalley & Gilson, 2004). Organizations need to ensure that they are incentivizing the behavior they want to encourage (Shalley & Gilson, 2004). If an organization encourages collaboration and information sharing, but only incentivizes individual performance, this misalignment of culture and incentives may not lead to the desired collaborative behavior (Dombrowski et al., 2007; Tan, 1998). Evaluation

and incentive systems need to be clearly defined so that employees understand what is expected from them, what the rewards are, how and when the rewards are delivered, and what the penalties might be (Shalley & Gilson, 2004).

If innovation is important then the organizational culture and leaders need to foster and support risk-taking and experimentation (Shalley & Gilson, 2004). Employees need to feel safe to take the risks that are associated with innovation (Dombrowski et al., 2007) and that they can expose their ideas to others without being judged (Shalley & Gilson, 2004). If employees are encouraged to try new ideas, but then penalized for failure it acts as a powerful disincentive to engage in future innovative behavior (Tan, 1998).

The management strategies that foster innovation differ from management strategies for other types of work and management strategies needed to foster innovation may even be different based on whether it is the idea generation or implementation stage of the innovation process (Mumford & Licuanan, 2004). Ultimately, successful innovative cultures are organization specific (Dombrowski et al., 2007) as organizations have different leaders, values, norms, human and financial resources, strategies, and competitive environments. Even within an organization, what works for one innovation project may not work for another (Lee & Kelley, 2008).

Innovation leadership. A subset of the body of leadership research is the effect of leadership or management on organizational or employee innovation capability (Charbonnier-Voirin et al., 2010; Gilley et al., 2008; Horng et al., 2011; Krause, 2004; Lee & Kelley, 2008; Michaelis et al., 2009; Michaelis et al., 2010; Musteen et al., 2010; Paulsen et al., 2009; Wang & Casimir, 2007). Leadership research is focused primarily on exploring the effect of

transformational or charismatic leadership on organizational and employee innovation activities and behavior.

Leaders facilitate employee creativity through activities or behaviors such as psychological empowerment (Gumusluoğlu & Ilsev, 2009b), participative management (Wang & Casimir, 2007), and by providing support to help employees share ideas (Damanpour & Schneider, 2006). Individual leader attributes such as their ability to establish a culture or climate that fosters innovation (Damanpour & Schneider, 2006; Gilley et al., 2008) or a lack of knowledge (Horng et al., 2011) may be facilitators of, or barriers to, organizational innovation.

The leader's attitude toward change has also been identified by researchers as a key attribute for successfully leading innovation. Leaders who are open to, value, and can adapt to change are identified as more likely to foster creativity (Wang & Casimir, 2007) and innovation (Damanpour & Schneider, 2006; Lee & Kelley, 2008; Musteen et al., 2010).

The majority of the literature exploring the relationship between leadership and innovation has focused on supporting transformational leadership as a key driver of organizational innovation (e.g. Aragón-Correa et al., 2007; Jung et al., 2003) due to the impact of transformational leaders on individuals within the organization and on the organization as a whole (Gumusluoğlu & Ilsev, 2009b). Transformational leadership behaviors that facilitate organizational innovation include: having a vision for the organization (Burns, 1978); identifying the organizational values and norms (Northouse, 2007); helping to create an environment for creativity (Wang & Casimir, 2007); establishing reciprocal trust with employees and stakeholders (Michaelis, et al., 2009); communicating to employees the vision and purpose of the organization (Charbonnier-Voirin et al., 2010; Sarros, Cooper, & Santora, 2011); increasing receptiveness to (Michaelis et al, 2010) or adaptability for (Charbonnier-Voirin et al., 2010)

change; team building (Aragón-Correa et al., 2007); and accepting risk and the possibility of failure (Northouse, 2007). The role of transformational leaders is viewed as one of coordination and collaboration rather than command and control with facilitating organizational learning identified as a key role (Aragón-Correa et al., 2007).

A leader's influence on the organizational culture and values, has been discussed as both contributing to and hindering innovation (Yukl & Lepsinger, 2006). Leaders shape an organizations' potential to generate innovations by fostering a culture of innovation that facilitates knowledge generation and implementation (Aragón-Correa et al., 2007). Research has shown that the leadership style of individual leaders, how effectively they support and encourage employees to achieve organizational goals (Lee & Chang, 2006), and their ability to implement change and drive innovation (Gilley et al., 2008), is crucial to successful innovation.

Researchers also have identified additional areas where empirical research on leading organizational innovation is lacking such as leadership and its relation to innovation implementation behavior (Michaelis et al., 2009; Mumford & Licuanan, 2004) and with leadership across different types of innovation (Friedrich et al., 2010).

It is important to acknowledge that our fundamental understanding of the leadership behavior that most effectively fosters innovation is still incomplete. While the focus of this dissertation is not on leadership, it is important to note that, even with extensive research, understanding the components of innovation remains a challenge.

Individual-level innovation. The importance of the individual in the process of innovation and as the basis for innovation is discussed extensively in the literature. The ability of an organization to innovate is founded upon individual creativity (Amabile, et al., 1996; Bassett-Jones, 2005; Klijn & Tomic, 2010) as it is the ideas generated by individuals that provide

the foundation for organizational innovation (Gumusluoğlu & Ilsev, 2009b; Shalley & Gilson, 2004). Research on the determinants of individual-level creativity in relation to organizational innovation has included: characteristics of the individual (Hammond et al., 2011); the role of leaders (Mumford et al., 2002; Paulsen, Maldonado, Callan, & Ayoko, 2009; Shipton et al., 2005; Stenmark et al., 2011); organizational innovation processes (Desouza et al., 2009); individual and organizational mechanisms supporting innovation (Bharadwaj & Menon, 2000); and organizational culture (Dombrowski et al., 2007).

Research has found that organizations cannot afford to have innovation and creativity viewed as the responsibility of only certain individuals or departments within the organization as implicit or explicit compartmentalization of innovation leads others in the organization to believe that innovation is not their responsibility and innovation may even come to be viewed as "…an intrusion in their lives because innovation means change. Without the understanding and support of everyone in the organisation, many large-scale and fundamental innovations are likely to fail…." (Ng, 2004, p. 97). Andriopoulos and Dawson (2009) also address the potential danger of limiting innovation capability:

> …processes of change, creativity and innovation overlap and interlock, and, as such, decisions to focus on only one element (for example, the creative component of the equation) would limit the potential for radical change in the uptake of new products and services since ideas are only the raw material for innovation and change; they do not by themselves guarantee transformation. (pp. 7–8)

The establishment of a new team or division focused on innovation may create two classes of corporate citizens (Kanter, 2006); those designated as innovators and those seen as not innovative enough to join the new team. Employees labeled as "non-innovative" may be marginalized in that access to new projects may be denied them (Kanter, 2006) and changing priorities may cause resources previously available to their projects or divisions to be redirected

to support innovation activities. In addition, by being denied access to the "star" innovation projects, these employees designated as non-innovators may lose opportunities to learn and build new skills and may find their opportunities for advancement within the company limited. Kanter (2006) states that "a culture of innovation grows because everyone can play. While groups pursue the big projects and temporary teams develop midrange ideas, everyone else in the company can be invited to contribute ideas" (p. 80).

Amabile and Khaire (2008) also view innovation as a group effort and that leadership's priority should be to engage the right people in the process. Peter Senge interviewed in Webber (1999) elaborates on the idea of engaging the right people: "Find the people who are at the heart of the value-generating process—who design, produce, and sell products; who provide services; who talk to customers" (p. 4). Amabile and Khaire (2008) also illustrate this concept by relaying a story from Intuit cofounder Scott Cook:

> Cook told the story of an eye-opening analysis of innovations at Google: Its founders tracked the progress of ideas that they had backed versus ideas that had been executed in the ranks without support from above, and discovered a higher success rate in the latter category. (p. 102)

Building confidence and self-efficacy in employees is a win for innovative organizations because increased feelings of self-efficacy in employees lead to higher creative performance, the increased generation of novel ideas and solutions (Gumusluoğlu & Ilsev, 2009a; Shalley & Gilson, 2004) and increases the organization's future capacity for innovation.

Idea sharing. Idea sharing in the context of this study refers to individual employees generating ideas independently (idea is original to employee or derived from interaction between the employee and customer). It is assumed that idea generation does not occur in an organizational vacuum and that the ideas generated by employees may also be inspired or

influenced by the employee's interaction with colleagues; however, for the purpose of this study it is assumed that any ideas generated in these employee-employee interactions are "owned" by the individual who shares the idea.

Organizations have sought to encourage employees to share their ideas through a variety of idea capture schemes (Leach, Stride, & Wood, 2006) such as idea sharing software, intranet platforms, and suggestion boxes. However, even when idea capture schemes are in place, participation is typically low (Leach et al., 2006). If new ideas are not articulated so that they can be shared, they cannot be implemented (Rank et al., 2004). Research on knowledge management within organizations has addressed barriers to the sharing of knowledge (Leach et al., 2006); however, the sharing of knowledge and sharing of ideas are not necessarily the same. Employees may have knowledge about their jobs or customers which will form the basis for the development of their ideas; however, sharing knowledge of what a customer may want is not the same activity as an employee sharing their personal idea with the organization for a new or improved product or service.

Open Innovation

Organizations are searching for new innovation strategies to meet market demands including making it easier to span the boundary between the organization's internal innovation activities and the external environment (Gassmann & Enkel, 2004). The sourcing and exploitation of external ideas is important to an organization's ability to be innovative (Cohen & Levinthal, 1990; Laursen & Salter, 2006). While new product development is both challenging and risky, successful new product development and innovation are critical if an organization wants to acquire or maintain competitive advantage (Monsef & Ismail, 2012).

Traditionally, organizations have relied on a closed system for innovation where idea generation and implementation are limited to employees who are part of the formal internal research and development or new product development processes (van de Vrande et al., 2009). Today, organizations looking for new ideas and information to improve their position in the marketplace are increasingly relying on outside sources; combining the ideas and information gathered from these external sources with their internal sources for innovation (Spithoven, Vanhaverbeke, and Roijakkers, 2013).

Henry Chesbrough coined the term open innovation in 2003 (Chesbrough & Bogers, 2014). Open innovation is defined as "the use of purposive inflows and outflows of knowledge to accelerate internal innovation and to expand the markets for external use of innovation, respectively" (Chesbrough et al., 2006, p. 1). It is a strategy for how organizations can innovate by soliciting ideas from outside the organization or can benefit from their internal innovation activities through sharing intellectual property and innovations with external partners. There are three categories of open innovation: inbound, outbound, and coupled (Gassmann & Enkel, 2004). Chesbrough (2003) identified inbound (outside in) and outbound (inside out) open innovation. A third category, "coupled" open innovation was introduced in 2004 by Gassman and Enkel.

In inbound open innovation, the innovation process is opened to leverage the discoveries of others with ideas flowing into the organization from partners such as customers, suppliers, crowdsourcing, competitors, universities, research centers, or governmental entities (Brunswicker & Vanhaverbeke, 2015; Cheng & Huizingh, 2014; Chesbrough & Crowther, 2006; Santoro et al., 2016). For the purpose of this study the definition of inbound open innovation

used in the survey was: an organization utilizing resources other than a formal internal research and development process to generate ideas for new or improved products and services.

Outbound open innovation is the process of leveraging internally developed ideas and intellectual property to external partners through licensing, selling intellectual property, spinning off parts of an organization, alliances, and joint ventures (Brunswicker & Vanhaverbeke, 2015; Chesbrough & Crowther, 2006; Gassman & Enkel, 2004). Outbound innovation can be used to: bring ideas to market faster, commercialize ideas in different industries, access new sources of knowledge, and increase revenue (Gassmann & Enkel, 2004). Coupled open innovation is when organizations engage in both inbound and outbound open innovation simultaneously often through participation in strategic networks (Gassmann & Enkel, 2004).

Open innovation has been widely discussed and researched. There are many studies showing open innovation may positively impact innovation performance (Santoro et al., 2016); however, systemic evidence regarding the adoption of open innovation in organizations is scarce (Chesbrough & Brunswicker, 2013). Chesbrough and Brunswicker (2013), in the first large-scale, quantitative study of open innovation in large organizations, found that 78% of respondents reported practicing open innovation and 30% reported practicing open innovation for more than 10 years. Chesbrough and Brunswicker (2013) also found that, for the year 2011, the share of innovation projects with an inbound component was 35% while 8% of innovation projects had an outbound activity.

These large organizations, with revenues in excess of $250 million and more than 1,000 employees, identified employees as the most important innovation partner followed by customers, universities, and suppliers (Chesbrough & Brunswicker, 2013). Customers, are an important resource for new product development in both large and small organizations (Coviello

& Joseph, 2012) and the customer or user's role in the innovation process is frequently discussed in the literature as an important source for innovation (Gassmann & Enkel, (2004). Coviello and Joseph in their 2012 study, found that organizations that were successful innovators understood the potential of learning from others, were able to import knowledge from their customers into innovation efforts, and were open to customer-initiated efforts.

According to West and Bogers (2014), organizations are motivated to engage in open innovation for one of two reasons: either "…improved efficiency through scale economies and access to innovations (or innovation-producing capabilities) not held by the focal firm" (p. 815). The openness of an organization is often defined as a function of the number of external sources of knowledge utilized (e.g. Laursen & Salter, 2004; Lazzarotti & Manzini, 2009). Brunswicker and Vanhaverbeke (2015), however, argue it is not the number of sources that determines success as not all potential sources of knowledge are of equal value to all organizations.

The level of openness adopted by an organization, as well as during which stage(s) the organization utilizes open innovation, determines the types and quality of inputs, levels of complexity, advantages and disadvantages, and the organizational and leadership approaches required to manage the innovation process (Lazzarotti & Manzini, 2009). Engaging in open innovation requires organizations to consider how they will: manage talent, source ideas, collaborate with external partners, manage the innovation process, leverage existing internal knowledge, and adapt their business model (Chesbrough, 2003a; Ollila & Yström, 2015). Successful open innovation collaboration requires, at a minimum, active management; chiefly "…the capability to manage knowledge flows and coordinate relationships between the innovation partners" (Ollila & Yström, 2015, p. 256).

Open innovation in most organizations still relies on informal practices as much as formal practices (Chesbrough & Brunswicker, 2013); however, successful adoption of open innovation across an organization requires moving open innovation from an *ad hoc*, trial-and-error process to a formal system (Chesbrough & Crowther, 2006; Chesbrough & Brunswicker, 2013). The more informal dimension of open innovation includes: an organization's culture, values, and personal relationships of individuals (Chesbrough & Crowther, 2013). A formal open innovation system might include: documentation of open innovation strategy, written and standardized processes, and metrics for measuring the impact of open innovation (Chesbrough & Brunswicker, 2013).

In large organizations, adoption of open innovation does not appear to replace internal research and development activities but instead acts as a complement to them (Chesbrough & Crowther, 2006). Given the much smaller resource pool of small and medium sized enterprises (SMEs) and their difficulty in holding all research and development activities within an organization (Brunswicker & Vanhaverbeke, 2015), it is not clear if that complementary trend would also be seen in in SMEs or if SMEs are using open innovation to replace internal research and development.

Arguments have been made that open innovation as defined by Chesbrough (2003) is an activity that companies have engaged in for a long time and it is therefore it does not represent a new phenomenon (Chesbrough & Bogers, 2014). How organizations involved external sources such as customers and suppliers in their innovation activities was the subject of research prior to Chesbrough's (2003a) articulation of open innovation (Gassmann & Enkel, 2004; West & Bogers, 2013). A second argument against the need for researching open innovation is that it is merely a new name for an established concept implying that there is not a need to discuss it as a

separate theory (Chesbrough & Bogers, 2014). Chesbrough and Bogers (2014), however, view open innovation as a joining of disparate theories, such as user-centered innovation (von Hippel, 2005), distributed sources of innovation (Bogers & West, 2012), and supply chain management under one umbrella concept. Open innovation incorporates the differing conditions under which innovation is taking place today including growing access to venture capital, collaboration with universities, and increased mobility of workers (Gassman & Enkel, 2004).

Barriers to open innovation. Barriers to open innovation can be either external or internal and may vary depending upon the type of open innovation activities an organization is engaging in as well as the organization's business model, culture, resources, and partners (Lahi & Elenurm, 2014). Each factor that is a part of the open innovation process has an opportunity to be either a facilitator or barrier (Lahi & Elenurm, 2014); for example, organizational culture can act as either a barrier to or facilitator of an organization's engagement in open innovation activities.

Chesbrough and Crowther's 2006 study identified the not-invented-here syndrome and sustaining internal commitment over time to realize benefits as two significant challenges to be overcome for adoption of open innovation in organizations. Chesbrough and Brunswicker (2013) found in their study that large organizations identified internal organizational change as the most significant challenge they faced when the organization first implemented open innovation practices and identified that it was still the main challenge to their open innovation activities at the time of the survey. The second most significant challenge reported was managing external relationships with innovation partners (Chesbrough & Brunswicker, 2013). Two barriers that have been extensively discussed in the literature are absorptive capacity and the not-invented-here syndrome.

Absorptive capacity is a necessary component to engage in and benefit from inbound open innovation (Cohen & Levinthal, 1990; Spithoven, Clarysse, & Knockaert, 2011) and a lack of absorptive capacity can hinder an organization's open innovation activities. Absorptive capacity refers to an organization's ability to recognize the value of external information, to integrate that information into the organization, and to apply it commercially (Cohen & Levinthal, 1990). It is assumed that most organizations in traditional industries lack the absorptive capacity to integrate and transform external knowledge into innovative products and services (Spithoven et al., 2011).

Cohen and Levinthal (1990) believe that an organization's absorptive capacity is both a function of the organization as well as its individual members. The ability to utilize external knowledge is dependent on prior knowledge within the organization and, for example, in the individuals at the boundaries between the external environment and the organization or between subunits within the firm (Cohen & Levinthal, 1990). While absorptive capacity is primarily discussed in the extant literature in terms of bringing external knowledge into to the organization, per Cohen and Levinthal's (1990) discussion of the concept, it can potentially be extended to include an organization's ability to integrate ideas generated by internal employees who are not normally a part of the organization's research and development processes.

One example of an individual barrier to the successful integration of external ideas into an organization is the not-invented-here syndrome. In the not-invented-here syndrome, internal "experts" within the organization may resist or reject ideas and information from external sources (Laursen & Salter, 2006) as they hold a bias against someone from outside their area having the knowledge needed to contribute a valid idea (Katz & Allen, 1982). This bias can cascade within an organization if research and development departments continue to hire

individuals who have similar knowledge or thinking to current employees; thusly, reducing diversity of thought and experience within the department and the cognitive pool from which to draw ideas (Kanter, 1988; Katz & Allen, 1982).

Chesbrough and Crowther (2006) identify not-invented-here syndrome as a significant challenge to adoption of open innovation practices. They found that organizations were able to overcome the challenge by clearly explaining the need for outside information to support organizational objectives and by looking at technologies where internal R&D can be leveraged (Chesbrough & Crowther, 2006). Gassmann, Enkel, and Chesbrough (2010) approach the not-invented-here syndrome in the context of organizational culture and the need to create a culture that values outside knowledge for successful open innovation to occur. They identify factors such as the values of the organization, communication platforms, and incentive systems as influencing culture and organizational receptiveness to new ideas (Gassmann et al., 2010).

Most of the extant literature on not-invented-here syndrome in open innovation focuses on the integration of external ideas into the organization; however, Katz and Allen (1982) specifically addressed it in terms of resistance of research and development employees to ideas from others within their organization. They discuss the need to move employees around in the organization to give them new experiences as well as having different mechanisms in place for employees across departments or divisions to exchange ideas and information (Katz & Allen, 1982). This resistance to new ideas, even from internal sources, can be a powerful barrier to successful innovation.

Open innovation in small and medium-sized enterprises. Research on open innovation activity in SMEs is limited as the majority of open innovation research to date has focused on large and multi-national organizations (Brunswicker & van de Vrande, 2014;

Gassman, Enkel, & Chesbrough, 2010; Vanhaverbeke, 2017) or particular industries, while open innovation practices in small- and medium-sized organizations (SMEs) outside the context of high-tech have been largely unexplored (Brunswicker & van de Vrande, 2014; Brunswicker & Vanhaverbeke, 2015; van de Vrande et al., 2009; Wynarczyk, Piperopoulos, & McAdam., 2013). In addition, further research on low-tech industries (Vanhaverbeke, Chesbrough, & West, 2014) and service industries is needed (van de Vrande et al., 2009).

The limited available research indicates that while SMEs engage in open innovation (Chesbrough & Crowther, 2006; van de Vrande et al., 2009; Theyel, 2012), they may do so at a lower rate than larger organizations (Gassman et al., 2010; Hossain, 2015). van de Vrande et al. (2009) found that SMEs were extensively and increasingly practicing open innovation, however, medium-sized organizations engaged in open innovation more frequently than small organizations. Results of a study of Italian SMEs by Santoro et al. (2016) showed that two-thirds of surveyed SMEs engaged in open innovation. Brunswicker and Vanhaverbeke (2015) found that SMEs were not functioning as either completely open or closed, but instead operated on a continuum utilizing varying mixtures of external knowledge sourcing strategies.

SMEs suffer from a "liability of smallness" in innovation and new product and service development with fewer human, financial, and organizational resources (Santoro et al., 2016). SMEs appear to engage in open innovation for market-related motives, such as to stay ahead of competition, and to meet changing customer demands (van de Vrande et al., 2009; Vanhaverbeke, 2017). The open innovation practices that SMEs were most engaged in were informal and inexpensive practices such as customer involvement and networking (van de Vrande et al. 2009). Van de Vrande et al. (2009) found that, with the exception of outbound

open innovation activities such as outsourcing and licensing intellectual property, open innovation was as important for service firms as it was for manufacturing firms.

How open innovation takes place in SMEs and how SME open innovation differs from that of large organizations remains mostly unclear (Brunswicker & van de Vrande, 2014). What is clear is that SMEs cannot simply adopt the open innovation practices of large manufacturing organizations because the organizational context and the models and activities of SMEs are so different from those of large organizations (Brunswicker & Vanhaverbeke, 2015; Vanhaverbeke, 2012; Vanhaverbeke, 2017). One significant difference is that open innovation in SMEs is typically managed by the entrepreneur or owner (Vanhaverbeke, 2017). In addition, small organizations manage their network of innovation partners using "…personal relationships, trust, speedy decision-making, and informal communications…" (Vanhaverbeke, 2017, p. 8). Managing open innovation requires a different approach than managing closed innovation (Ollila & Yström, 2015).

Brunswicker and Vanhaverbeke (2015) explain that the diversity and combination of innovation sources (customers, suppliers, experts, etc.) utilized in open innovation is more important to success than the total number of sources; however, the effectiveness of idea sourcing from external partners is dependent on the SME's internal processes for managing innovation. The process of utilizing and managing open innovation in SMEs requires specific and new capacities for organizational knowledge and innovation management (Brunswicker & Vanhaverbeke, 2010; Brunswicker & van de Vrande, 2014); however, open innovation in many SMEs is hit or miss without a structured process for capturing or implementing ideas in place (Gassman, Enkel, & Chesbrough, 2010).

In addition to needing new organizational capabilities, open innovation in SMEs also

requires new skills and behaviors from individuals within the organization (Brunswicker & van de Vrande, 2014) and the human aspect of open innovation has yet to receive sufficient research attention (Vanhaverbeke et al., 2014). Lahi and Elenurm (2014) identified the innovation leader, manager, or entrepreneur to be the most critical factor for open innovation success. In particular, the leader's attitudes, personal properties, and knowledge. The second most critical factor identified was access to human capital with appropriate attitudes (Lahi & Elenurm, 2014).

There have been few attempts to explain barriers to open innovation adoption within the specific context of SMEs (van de Vrande et al., 2009). SMEs, in general, have significant barriers to innovation due to their size and lack of financial and human capital resources as well as small innovation portfolios which limit the spread of risk (van de Vrande et al., 2009).

Van de Vrande et al. (2009) found that the most significant organizational barriers to successful open innovation identified by SMEs were interorganizational issues related to the cooperation between the organization and its external partners. These included: administrative burdens or culture differences involved in working with other organizations; problems related to division of tasks and responsibility among organizations; and communication problems within and between organizations (van de Vrande et al., 2009). Bigliardi and Galati (2016) identified four categories of factors that acted as barriers to open innovation: knowledge barriers, collaboration barriers, organizational barriers, and financial and strategic barriers. Specific hindering factors included: economic/financial issues, lack of adequate managerial competencies, costs, finding appropriate partners, and cultural resistance inside the firm.

Van de Vrande et al. (2009) also identified: the costs of innovation and time needed, employee's lack of knowledge, lack of employee commitment to innovation, resistance to

change, employees having too many ideas, and lack of management support as factors acting as barriers in SMEs to employee involvement in open innovation activities.

The scope and size of a proposed innovation, in a form of the not-invented-here syndrome, has also been discussed as a barrier to open innovation in SMEs. Organizations and entrepreneurs may focus their efforts on creating radical innovations that have a greater potential impact on the organization; marginalizing those who are not directly involved in these types of big projects and rejecting ideas that appear small or without the potential to generate significant revenue (Kanter, 2006).

Business model and strategy. Chesbrough (2003) in his book Open Innovation identified the use of open innovation as directly tied to the business model but focused the discussion on open innovation as an opportunity to create and capture more value within an existing business model (Vanhaverbeke & Chesbrough, 2014). Later, Chesbrough (2006) addressed innovating the business model itself to capture value from the organization's open innovation activities (Vanhaverbeke & Chesbrough, 2014). Vanhaverbeke and Chesbrough (2014) argue that there is no way to discuss open innovation without also addressing the business model because the value of an idea or innovation is determined by the business model used to bring it to market. Organizations utilizing open innovation need to have a business model that is aligned with their open innovation practices to capitalize on those activities (Chesbrough, 2006).

A business model is the framework outlining for an organization that tells what activities the organization will engage in: (1) to create value by developing a product or service that appeals to a customer target market, and (2) how it will capture that value (Vanhaverbeke & Chesbrough, 2014). The business model framework basically articulates

the strategy of the company regarding: what product or service it will sell, who it will sell it to, why the customer will buy it, and how the organization will generate profit from the sale.

The terms "open innovation" and "open business model" have come to be used interchangeably, however, they represent two different concepts (Vanhaverbeke & Chesbrough, 2014). In open innovation, organizations gather knowledge from external sources, but those sources do not necessarily contribute to adding value to the organization (Vanhaverbeke & Chesbrough, 2014). Organizations with *closed business models* handle the marketing of a product or service using their own assets and do not share gathered value with partners, other than through typical market transactions (Vanhaverbeke & Chesbrough, 2014). Organizations with *open business models* share competencies to create value jointly with strategic partners and to share that value among partners (Vanhaverbeke & Chesbrough, 2014).

Open innovation and the business model in SMEs are even more closely tied together; studying open innovation in SMEs only makes sense if strategy and/or the business model are considered (Vanhaverbeke, 2017). Open innovation is often directly linked to a strategic change in an organization's overall business model (Brunswicker & van de Vrande, 2014). Small firms often must go through many iterations (pivots) of their business model before finding a model that is viable (Vanhaverbeke, 2017). SMEs can utilize business model innovation as a way to add value for their customers; however, when SMEs make major changes to their business models to capitalize on new opportunities, they often have to turn to external partners for resources and skills (Vanhaverbeke, 2017).

Non-research and development employees and innovation. Organizations face a constant tension between the need to continue current operations and the need to focus on the

future through innovation activities; internal sources such as employees provide an easily accessible source for value creation through innovation (Amundsen, Aasen, Gressgård, & Hansen, 2014; Kesting & Ulhøi, 2010). Employees have the day-to-day operations knowledge that top management may lack (Kesting & Ulhøi, 2010) and provide an opportunity to capture resources that are typically outside of the normal innovation process (Amundsen et al., 2014).

Closed innovation systems exclude non-research and development (non-R&D) employees–such as frontline employees—from the innovation process. Frontline employees are an important source of ideas for organizations based on their knowledge of organizational processes and customers (Hutter, Hautz, Repke, & Matzler, 2013) as well as their ability to obtain information from customers as to how products and services can be innovated to better satisfy them (Selden & MacMillan, 2006). Excluding these employees from the innovation process can have a significant impact on an organization's ability to generate value for customers; therefore, capturing their ideas and knowledge is vital to organizational innovation efforts (Selden & MacMillan, 2006).

Two areas of research that address the role of frontline or non-research and development employees in the innovation process are customer-centric innovation and employee-driven innovation. In customer-centric innovation the belief is that research and development (R&D) should be shifted from the traditional closed model to an R&D model where frontline employees are at the center of the innovation process (Selden & MacMillan, 2006). Frontline employees are closest to the customer and in the best position to understand the met and unmet needs of customers, to identify and deliver the value proposition for customer segments, and to be able to share information about customers within the organization (Selden & MacMillan, 2006). Benefits from customer-centric innovation include: improved competitive advantage through

knowledge acquisition, improved employee engagement and loyalty, and more satisfied customers (Selden & MacMillan, 2006).

Customer-centric innovation also has challenges such as the need for redirecting funding from traditional internal R&D activities to the new model, a focused and sustained long-term effort, and a willingness to change the R&D mindset (Selden & MacMillan, 2006). Barriers to successful customer-centric innovation include an organizational inertia to do the same thing as what has been done in the past, the view that formal R&D should be centralized and is entitled to receive financial support regardless of whether past R&D meets the needs of customers, and a view that those outside the R&D process cannot create new products and services as they lack technical R&D skills and experience (Selden & MacMillan, 2006).

Successful innovation depends upon the number and quality of ideas generated within an organization (Rietzschel, Nijstad, & Strobe, 2010). Idea generation and sharing by employees is, at least in part, determined by their perception of the organization's receptiveness to their ideas. Hammond, Neff, Farr, and Schwall (2011) found that motivation, job characteristics, autonomy, organizational expectations of innovative behavior from employees, feeling safe in risk-taking, and leadership behavior were all predictors of individual innovation performance. Lack of motivation, organizational support for creativity and innovation, lack of feelings of safety, and leader or managers that were not supportive of innovation would thus be barriers to individual innovation behavior. According to Tan (1998):

> People-related barriers to creativity include resistance to change, conflicts, and incompetence. Creativity means changes and resistance to change is a natural dynamic phenomenon. To promote creativity in organizations we must be more aware of the unhelpful reactions to change, such as, rejections of ideas and status-dominated evaluations. (p. 26)

Employee-driven innovation is based in the belief that all employees have the potential to contribute to innovation (Amundsen et al., 2014). Successful employee-driven innovation requires the conviction of top management that employee-driven innovation is fundamental to the organization's innovation capacity and for leaders to change how they interact with employees to more of a coaching relationship (Amundsen et al. 2014; Kesting & Ulhøi, 2010).

Key characteristics of organizations with successful employee-driven innovation efforts are: communication, openness to new ideas, information exchange, creativity, tolerance of failure, employee knowledge of organization and its strategy, an expectation that employees look beyond their own area of expertise to contribute to the future of the organization (Amundsen et al. 2014) and incentives (Kesting & Ulhøi, 2010). The role of the manager or supervisor was also found to be important as the person who is closest to daily operations and employees and can capture ideas and motivate employees to share ideas (Amundsen et al., 2014; Kesting & Ulhøi, 2010).

Research by Chesbrough and Brunswicker (2013) on open innovation in large organizations found that internal employees were considered as the most critical partner in open innovation. Employee involvement in open innovation, however, was also considered as a barrier by some SMEs due to issues such as: such as: employees do not have the skills or motivation to make valuable contributions; too many ideas from employees to handle efficiently; and management deciding not to collect or implement ideas (van de Vrande et al., 2009).

While some researchers consider employee involvement by non-R&D employees to be "outside" of the organization and view these internal innovation sources as partners in inbound open innovation (e.g. Chesbrough & Brunswicker, 2013; Santoro, et al., 2016; van de Vrande, et

al., 2009) other researchers do not address the role of non-R&D employees in their discussions of inbound open innovation.

Non-research and development (non-R&D) employees for the purpose of this study are defined as those employees who do not have any direct or formal responsibility for innovation or new and improved product or service development. For the purpose of this dissertation, the categories of inbound open innovation activities included employees in the organization that are not directly or formally involved in research and development or new or improved product and service development activities.

Review of Existing Instruments

A variety of instruments exist for measuring creativity and innovation on the organizational and individual level. Some of the instruments most commonly used to measure the organizational climate or culture for innovation include the: KEYS to Creativity and Innovation (previously the Work Environment Scale), Creative Climate Questionnaire, and the Siegel Scale of Support for Innovation (Mathisen & Einarsen, 2004).

The KEYS to Creativity and Innovation instrument, formerly the *Work Environment Inventory*, was developed as a tool for scholars to assess contextual influence on creative behavior in organizations by examining perceptions influencing the generation and creation of creative ideas (Amabile, et al., 1996). For practitioners, the KEYS to Creativity and Innovation instrument can be used to diagnose "…the degree to which an organization's work environment fosters creative work in individuals and groups." (Amabile et al., 1996, p. 1162).

The Kirton Adaptation-Innovation Inventory instrument, containing 32 questions, measures an individual's propensity to innovate (Bobic, Davis, & Cunningham, 1999). It evaluates problem-solving and creativity (KAI, n.d.) and is designed to identify an individual's

decision-making style (Bobic et al., 1999). The results can be used to identify diversity of thought within a team to facilitate effective collaboration (KAI, n.d.). The Creative Climate Questionnaire was designed to measure the organizational climate (organizational reality not perception) for creativity and conditions that may support or hamper innovation (Mathesin & Einarsen, 2004). The Siegel Scale of Support for Innovation was designed to assess the presence of factors expected to be seen in innovative organizations based on the employees' perception of the organizational climate as being supportive of creativity and innovation (Mathesin & Einarsen, 2004).

These existing instruments, while validated, are not sufficiently broad in their scope to address all of the research questions in this study. The instruments address either the perception of organizational climate or the organization's receptiveness to creativity which are components of the research questions for this study. However, I also seek to understand both the organization's use of open innovation, the mechanisms utilized, and the source of ideas for innovation either within the organization as well as the perceived barriers to sharing or implementation of ideas. I was unable to find an existing validated scale that would measure the constructs I am seeking to understand; therefore, it was necessary to look to the literature to build a survey instrument that effectively addressed the full scope of the research questions for this study

Conclusion

Innovation is one of the most important topics in business today both in practice and in research. Innovation is how organizations create value for customers and stakeholders and is required for organizational success in the rapidly changing global marketplace. Understanding the organizational and individual factors that facilitate innovation has been the focus of extensive

research yet there are still many unanswered questions including: what the sources of innovative ideas within organizations are and how do those innovations get implemented?

The traditional model of closed innovation where an organization's innovation and new product development activities are confined to employees with innovation as part of their formal job expectations no longer works in the increasingly short product development cycles. Open innovation provides a framework for how organizations can leverage external resources and bring ideas into an organization. Utilizing inbound open innovation, organizations can source ideas from external partners such as customers, users, suppliers, and universities. In this study, the definition of open innovation is expanded to include those employees within an organization who are not tasked with innovation or new product development, including frontline employees who have direct contact with customers.

Innovation, new product development, and open innovation in SMEs requires different competencies, processes, and activities than engaged in by large organizations. Most of the research in this area to date has focused on large organizations leaving a knowledge gap regarding how the generation and capture of ideas gathered through inbound open innovation activities or generated within the organization by non-R&D employees occurs and how successful or useful to the organization those efforts are.

This study seeks to clarify the source(s) of ideas for new innovations and what open innovation activities SMEs are engaged in. In addition, the study seeks to identify organizational or individual barriers which may be impacting the innovation process and the perception of employees and executives as to an organization's processes for and receptiveness to open innovation.

Chapter III: Methodology

This chapter discusses the methodological approach and research design for this mixed methods study which explored inbound open innovation in small- and medium-sized enterprises as well as barriers that may prevent the effective solicitation, capture, and implementation of ideas. The research methodology for this dissertation was an exploratory descriptive comparative embedded mixed methods QUAN(qual) design.

Combining quantitative and qualitative data in a mixed-methods study provides a more complete understanding of a phenomenon than either method can provide on its own and helps to address the limitations of each method (Creswell & Plano Clark, 2011). Given the nature and complexity of the phenomenon this study seeks to understand, a mixed methods approach will provide findings with greater depth and relevance.

Quantitative and qualitative data were collected concurrently via an online survey distributed through Amazon's® Mechanical Turk® platform from and then analyzed using descriptive and comparative statistical procedures.

There were three main research questions and two sub-questions for this study:

(1) To what extent do executives and employees in SMEs perceive that their organization engages in open innovation? Where do ideas for new or improved products and services originate in SMEs?

(2) How do executives and employees perceive their organization's receptiveness to employee ideas for new or improved products or services and what barriers does each group perceive to sharing or implementing those ideas?

(3) How do executives and employees differ in their perception of the organization's receptiveness to employee ideas and the barriers that exist to sharing and

implementing employee ideas as part of the open innovation process? How does organization size affect open innovation activities and perception of innovation processes and activities?

Research Methodology

The research methodology for this study was an exploratory descriptive comparative embedded mixed method QUAN(qual) design. Quantitative and qualitative data were collected concurrently via an online survey and then analyzed using descriptive and comparative statistical procedures. The quantitative methodology utilizing a survey allowed for the collection of varied data that articulated current practices within an organization related to collection of ideas and development of new and improved products and services. Quantitative and qualitative data were also collected on individual respondent's perceptions of those practices and the organizational climate as a means of comparing the perceptions of those with ownership or executive roles and those of non-managerial employees.

With the qualitative portion of the study I was able to move beyond quantitatively describing the frequency of open innovation practices to, gain an enhanced view of the perceptions and barriers influencing open innovation efforts in small and medium-sized enterprises. Open-ended narrative survey questions provided an opportunity for respondents to expand on their perceptions and to articulate their personal experiences with the phenomenon adding greater depth and understanding to the quantitative data.

Research Methodology Justification

Research methods have different purposes and are suitable for addressing different types of research questions; the research question determines the choice of method (Tashakkori & Teddlie, 2010). Quantitative research is utilized to test hypotheses, determine frequency, and

show how broadly phenomena are experienced. Qualitative research is appropriate for exploring the how and why of phenomena (Kvale & Brinkman, 2009). In a complementary mixed methods study such as this, qualitative and quantitative data are used to assess different aspects of a phenomenon (Green, Caracelli, & Graham, 1989). Combining quantitative and qualitative data provides a more complete understanding of a phenomenon than either method can provide on its own and helps to address the limitations of each method (Creswell & Plano Clark, 2011).

Mixed methods are not appropriate for every research question. Like any approach to research, the mixed method approach has its own advantages and disadvantages. Advantages of using a mixed method approach identified by DeCuir-Gunby (2008) or Creswell and Plano Clark (2011) include: offsetting the strengths and weakness of using only one methodology and being able to utilize all the available tools for research such as multiple methods of data collection and both numbers and narrative. In addition, a mixed method approach also allows for the ability to corroborate findings and both generate and test theory in one research project as well as the ability to address complex research questions that cannot be answered by either quantitative or qualitative research alone.

Given the nature and complexity of the phenomenon this study sought to understand, a mixed methods approach provided an opportunity to gather findings with greater depth and relevance than utilizing only one method could have.

Preparation for Data Collection

The study was based on the use of an online survey that was hosted on the SurveyMonkey® platform (See Appendix). A survey is a good design for a research study if the data can be most effectively obtained from respondents via brief answers to structured questions, the researcher knows how they will use the answers, and there is an adequate response rate

(Vogt, Paul, Gardner & Haeffele, 2012). Online surveys are a good choice for conducting research as it has several advantages including a population comfortable with using the internet for communications, access to individuals in distant locations, and the convenience of automated data collection (Selden & MacMillan, 2006).

Given the research questions for this study, there was no one existing survey instrument I could find which adequately addressed all three research questions; therefore, it was necessary to construct a new survey. Creating and preparing the survey for launch comprised both survey development and the expert and lay review of the survey. The goal was to collect a minimum of 250 usable survey responses—125 from owner/executives and 125 from employees—for data analysis.

Survey development. Survey development began with an extensive literature review and a review of existing survey instruments and scales available in the areas of: organizational innovation, individual innovation, open innovation, inbound open innovation, new product development, idea sharing, and small and medium enterprises. The literature review was utilized to construct survey questions that explored the phenomena based on the research questions. Special attention was paid to areas which had been identified as needing additional research in prior research studies, such as the need to enhance the knowledge of the organizational and individual barriers that prevented ideas from being solicited and moved to implementation as discussed by Chesbrough and Brunswicker (2013).

The statements on the survey, while based in the literature and on prior surveys developed in related areas, were written in my own words using layman's language. The survey questions were designed to be accessible to a wide-range of respondents who may not be familiar with the theories or topics being examined through the survey. For example, the term "inbound

open innovation" may be unfamiliar to many participants, thus, a simplified definition derived from the academic definition was created and examples provided for participants.

The survey contained three types of questions: questions regarding the organization's activities and processes; questions asking for participant's perception of their organization's activities, executives, and employees; and questions asking those in the Employee category to describe their personal experiences as employees. The questions that asked for the participant's perceptions were constructed as matrix questions utilizing a series of statements and a 6-point Likert-type response scale with *strongly disagree*, *disagree*, *somewhat disagree*, *somewhat agree*, *agree*, and *strongly agree* as response options. The use of a 6-point response scale was based on my preference for having a response option that kept it accessible to respondents and also avoided the use of a neutral midpoint (Baron, 2018).

The draft version of the survey utilized in the pilot study initially included five filter questions that addressed: participant employment status, whether the organization they worked for and the employee were both located in the U.S., the size of the organization (by number of employees), the type of organization (retail or wholesale), and whether the participant interacts directly with customers. These filter questions were selected because:

- I wanted information based on a participant's current experience.
- Only a small percentage of open innovation research involves U.S. organizations.
- The goal of this study was to examine what new and improved product and service development activities small and medium sized organizations engaged in.
- I was interested in the experience of frontline employees with idea sharing in their organization.

The filter questions determined if a participant was allowed to continue in the survey or would be disqualified from the study. The number of questions used for filtering were reduced from five to two following pilot studies; however, the other three questions were retained in the body of the survey, but not used for filtering.

The question identifying a participant's role within their organization was key to the branching used in the survey to separate respondents into two groups—Executives and Employees. In addition to common questions that were asked of both Executives and Employees, each group received a series of different questions appropriate to their role.

The survey was designed to branch to two separate question tracks depending upon how a participant identified their role within their organization. There were seven category options for participants to select from: owner; partner; executives, such as C-suite officers (Chief Executive Officer, Chief Operating Officer, Chief Information Officer, etc.); managers; supervisors or project/team lead; non-managerial employees; and other.

The role a participant selected determined which of the two available role groups—Executive or Employee—they would follow in the survey and which specific sets of questions they would receive. The Executive and Employee groups were established to reflect distinct spheres of influence within an organization. Executives were selected as one of the two groups for analysis because the link between open innovation in organizations and the role of the executives within the organization was identified as a research topic in need of further exploration by Vanhaverbeke, Chesbrough, and West (2014).

The Executive group included the roles of owners, partners, executives, and managers. These are individuals who usually have authority for the development of new products or improvements of existing products and/or for constructing organizational culture and processes

which will impact the collection and implementation of ideas. The Employee group included the roles of supervisors or project/team leaders, non-managerial employees, and other.

Once a survey participant selected a role, they followed one of the two question tracks. Approximately 70% of the survey questions were identical for both groups. The rest of each survey branch was designed to elicit additional organizational information from Executives and personal experience with open innovation from Employees. Executives received additional questions regarding their organization's new product development and open innovation activities. Employees received additional questions asking about their personal experiences in sharing ideas for new or improved products and services.

Expert and lay review of survey. The initial survey items I developed were reviewed by the members of my dissertation committee and then we worked together to extensively rewrite the survey items, lay out the survey structure, and to make sure the survey questions tied back to the research questions.

The draft survey was then distributed to a dozen experts in the area of open innovation research with a request for their feedback pre-Institutional Review Board approval. Researchers who have published multiple peer-reviewed articles in the area of open innovation and/or open innovation in SMEs were contacted via email and requested to review the survey. A dozen researchers, all but one located outside the U.S., were contacted for feedback on the draft survey. The expert who responded to the review request indicated that he felt the questions were appropriate for the research being conducted; therefore, no changes were made to the survey based on expert review.

Once feedback was received from my dissertation committee and the subject matter expert, the survey was pre-tested as a self-administered instrument accessed via a direct link on

the SurveyMonkey® platform. The input of a small group of pretest respondents, including the Antioch University Leadership and Change Program's Survey Research Group, was sought to complete the survey and to offer comments and feedback on the survey design and the individual questions.

Data Collection

Data collection began with the launch of the first pilot study which served as a pre-test to collect feedback on the draft survey document. Following the launch of the first pilot study, Amazon's® Mechanical Turk® was selected as the source for the participant pool due to the efficiency of collecting data on that platform. I conducted a second pilot study on the Amazon® Mechanical Turk® platform to familiarize myself with the mechanics of the platform and to identify any potential data collection issues prior to survey launch. Data collection activities included:

(1) pilot study: phase 1;

(2) determination of survey participant pool;

(3) pilot study: phase 2; and

(4) survey administration.

The survey was made available multiple times on Mechanical Turk® as it was not clear how many qualified responses would be received until after the survey availability window closed.

Pilot study: Phase 1. The survey information and link were distributed via a posting to my personal online social media sites such as LinkedIn and Facebook or via direct email contact with individuals to solicit responses and comments on the survey. In addition, a survey invitation was posted to several LinkedIn groups.

Twenty-one responses were received of which 13 were disqualified from participation based on their answers to the filter questions and the remaining eight responses were sufficiently complete for use in the data analysis. These responses were included in the final data set and used in the data analysis reported in Chapter IV.

The results of the first pilot study made it clear that the filter questions were too restrictive and made it difficult to collect responses. Following the feedback received from participants in the first pilot, the number of filter questions was reduced to two: participant employment status, and whether both the organization and the employee were located in the U.S.

No other changes were made to the survey items based on the feedback from the pilot survey; however, due to the difficulty of finding qualified participants and collecting data through my personal network, it was decided to explore the Mechanical Turk® worker pool, operated by Amazon®, for recruiting survey participants to increase the efficiency of data collection.

Determination of survey participant pool. The sample utilized was a convenience sample drawn from two sources: participants solicited via social media to complete the test-survey on SurveyMonkey® and workers on Amazon's® Mechanical Turk® platform. This was an exploratory study; therefore, it was logical to use a convenience sample that was accessible using reasonable effort and had a reasonable expense (Baron, 2018).

The minimum inclusion/exclusion criteria required that respondents were currently employed in a U.S.-based organization with their workplace also located in the U.S. The study was designed to collect data on the current experience of executives and employees within their organization so they were required to be currently employed. The requirement for it being a U.S.-based organization and for the employee to be working in the U.S. addressed my desire to

focus the study on exploring what was happening in U.S. organizations due to the majority of extant open innovation research on SMEs occurring outside the U.S. (Hossain, 2015).

The Mechanical Turk® platform is an online marketplace where requesters (researchers, businesses) can publish tasks to Mechanical Turk's® large international pool of workers. Tasks are posted to Mechanical Turk® as a human intelligence task, or (HIT); most HITs pay workers a small fee for successfully completing the task. The HIT contains a brief description of the project, what specific task the worker is being asked to complete, the fee they will be paid, any specific qualifications that are required for the task, and any time limits for completion. Once the HIT is made available, workers can self-select to complete the task and upon completion of the task their work is submitted to the requester for approval. Once approval is granted, the worker receives the promised fee which is transferred from the requester's Mechanical Turk® account to that of the worker.

Pilot study: Phase 2. The decision to utilize the Mechanical Turk® platform required a second phase pilot study to familiarize the researcher with the mechanics and process for using Mechanical Turk®, including best practices for designing a HIT and understanding how data is reported for analysis. HITs are posted in batches; a batch is a specific task with a set number of requested responses. When the number of requested responses is received the batch closes and it is no longer visible to workers.

The pilot batch HIT (batch 1) was set up with a brief task description and a link that would redirect the worker to the actual survey which was hosted on SurveyMonkey®. Mechanical Turk® does not allow requesters to solicit or collect any personal information from its workers, therefore, responses were as confidential as any response obtained by following a direct link to a survey. The batch was set up to obtain 20 responses. The survey used the same

format as that of the first pilot study. Workers completed the filter questions and if they were not qualified they received a disqualification message from SurveyMonkey®. Participants were directed through the survey based on their answers to the role question.

The pilot study was successful with 20 responses received. No changes to the items or survey questions were made based on the results of the Mechanical Turk® pilot study; however, small changes were made to how the HIT was constructed and the wording of the HIT description. In addition, a notice was added to the survey such that any Mechanical Turk® worker participant who was disqualified or completed the survey received a completion code that had to be entered before they submitted the HIT in Mechanical Turk® for the worker to receive credit and compensation for attempting or completing the HIT.

There is no automatic link between Mechanical Turk® and SurveyMonkey® such that Mechanical Turk® is notified that a Mechanical Turk® worker has completed the survey, therefore, to be sure that the person submitting the HIT has also completed the survey it is necessary to provide a completion code and/or to ask for the worker's Mechanical Turk® ID code (the code is a unique alpha-numeric string). Requesters can access a report that shows which workers (identified only by their ID code) submitted a HIT including the completion code to verify that the requester is only paying those workers who actually attempted or completed the survey.

Mechanical Turk® worker participants were allowed a time limit of an hour from the time they first accessed the HIT in Mechanical Turk® to the time they submitted the completion code. This requirement was to prevent someone from accepting a HIT and then not submitting a code in a timely fashion which would keep the batch open until the total number of requested

responses were successfully submitted potentially slowing down data collection. The qualified responses from the Mechanical Turk® pilot study were included in the final study and analyses.

Survey administration. Following the successful pilot study, five additional batches of HITs were launched to collect responses. The batches were posted in sequence as it was unclear until the batch closed how many useable responses would be obtained from the batch as not all workers would pass the filter questions. Workers who were disqualified by the filter questions and submitted HITS were still compensated for their attempt to participate albeit at a lower compensation rate than those who finished the survey. A total of 756 Mechanical Turk® workers attempted the survey in SurveyMonkey®.

A total of 312 useable responses were obtained from Mechanical Turk® which, along with the eight responses utilized from the first phase pilot study, brought the total to 320 useable responses for data analysis.

Data Analysis

Data analysis for this study included descriptive, comparative, and narrative data analyses. Quantitative data analysis began with a descriptive analysis for each question, including mean scores, standard deviations, and frequency and percentage distributions for all Likert-type response questions. Frequency and percentage distributions were computed for all category response questions, such as role and type of industry.

The grouping variable for the comparative data analysis was the respondent's role within their organization—Executive or Employee. Comparative analysis was conducted on the statements in Q11 and Q16 perception of the organization's processes for open innovation and Q12 and Q17 perception of the organization's receptiveness to open innovation survey questions completed by most survey participants. An independent-samples t-test was utilized to compare

survey results between the Executive and Employee role categories. The independent samples t-test is the appropriate data analysis method because I am examining differences between two groups (Salkind, 2008).

Chi-Square tests were utilized for analysis of data comparing results by organization size. Data compared by the Chi-Square method included: frequency of employee idea sharing; development of new products and services, presence of internal R&D; and whether open innovation was a formal or informal part of the organization's business model. Tukey's Honestly Significant Differences Test was utilized for post-hoc analysis.

Limitations

The study had potential limitations. The quantitative results of the study are dependent upon the quality and applicability of the survey questions as well as the sample size. The qualitative results are dependent upon the willingness of participants to answer open-ended questions and to provide narrative comments, expanding upon their quantitative responses.

A larger sample size would have allowed for more detail and potentially other avenues of analysis. The survey was also exploratory and, while respondents were asked for additional comments and narrative responses, the researcher did not actually speak with them which would have provided additional information and context for the study. The use of or addition of another method of data collection may have produced different or richer results.

The descriptive comparative nature of the study provided information that was used to describe what was happening with open innovation in small and medium sized organizations; however, the type of data collected did not provide sufficient information to conduct analysis that would identify which variables were influencing or generating an outcome.

Utilizing Mechanical Turk® for data collections also presented limitations. The participant pool was limited to those who signed up to participate in the online Mechanical Turk® marketplace. This automatically removed anyone from the participant pool who did not have an interest in being a member of the Mechanical Turk® workforce.

Ethical Protection

The ethics involved in research and protecting participants from harm is an important consideration. This research study was conducted, after approval from the Antioch University Institutional Review Board, using appropriate voluntary consent forms as well as identity and data protection practices and protocols. All participant survey responses were kept confidential and any potentially identifying information was removed prior to data analysis. During data analysis, responses were kept on a password protected laptop and online on SurveyMonkey® and Mechanical Turk® in password protected accounts. Data and analysis results were archived on a password protected encrypted external drive.

Survey respondents were asked a few demographic questions such as their gender or the size of their organization and their Mechanical Turk® identification number. The Mechanical Turk® identification number was used for verification purposes only and information about the respondent based on their identification number is not available to the researcher. Data from responses were analyzed in aggregate and any published information will discuss the results in aggregate with data articulated based on the role or role group a participant belongs to.

Summary

The research methodology and design of this study supports the exploration of open innovation and idea sharing in small and medium sized organizations. The study utilized a survey which allowed the researcher to gather both descriptive and behavioral data on

organizations and individuals and narrative data about respondents' personal experience with open innovation in their organizations. The data gathered was appropriate to address the research questions and provided a rich basis for data analysis.

Chapter IV: Results

The study sought to determine whether small- and medium-sized enterprises (SMEs), are engaging in open innovation activities, the source of new ideas for SMEs, and whether organization size had an impact on open innovation activities? The study also sought to explore the perception of executives and employees regarding organizational, top management, and employee beliefs and behaviors related to open innovation and employee idea sharing.

The study was designed to explore the following three main research questions and two sub-questions:

(1) To what extent do executives and employees in SMEs perceive that their organization engages in open innovation? Where do ideas for new or improved products and services originate in SMEs?

(2) How do executives and employees perceive their organization's receptiveness to employee ideas for new or improved products or services and what barriers does each group perceive to sharing or implementing those ideas?

(3) How do executives and employees differ in their perception of the organization's receptiveness to employee ideas and the barriers that exist to sharing and implementing employee ideas as part of the open innovation process? How does organization size affect open innovation activities and perception of innovation processes and activities?

Survey Structure

The survey utilized in this study was hosted on the SurveyMonkey® platform and collected nominal, ordinal, interval, and qualitative data via a mix of multiple choice, matrix, and narrative questions. Participants were primarily recruited using Amazon's® Mechanical Turk®

platform. Participants were required to identify their role within the organization both for demographic purposes and because a respondent's role in their organization was used to assign them to one of two groups–Executives or Employees–for comparative analysis. Data on organization size was also collected to enable comparative analysis by small (< 250 employees) and medium (≥ 250 and < 1,000 employees) sized organizations.

The survey had a total of 26 questions of which 11 were designed to elicit individual and organizational demographic information. In addition to the 11 demographic questions, the Executive group was asked eight additional role-specific questions while the Employee group answered seven additional role-specific questions. Of the total, 18 of the questions were required and eight questions were optional; however, whether a participant was asked to answer a question at times depended on their answer to a previous question. For example, an answer of "*no*" to a question skipped the participant one or two questions ahead as the "*no*" answer made the next few survey questions irrelevant.

The question numbers for three of the matrix questions were different for each group; however, the statements provided in the questions were exactly the same. Fourteen of the survey questions were presented to both the Executive and Employee group. An additional five questions were presented to Executives for a total of 19 questions. An additional four questions were presented to Employees for a total of 18 questions.

Data Cleaning

Data were collected via a direct link to the survey in SurveyMonkey® and via Amazon's® Mechanical Turk® platform where the HITs were constructed to provide workers with a pass-through link to the survey in SurveyMonkey®; therefore, all surveys were completed in

SurveyMonkey®. A total of 777 survey responses were received—21 from the SurveyMonkey® direct link and 756 completed by Mechanical Turk® workers.

Survey responses were downloaded from SurveyMonkey® to the Statistical Package for the Social Sciences® (SPSS) program. All data analysis was completed using SPSS® beginning with the review of responses to determine qualification. The initial data cleaning sort used three questions as a parameter for determining qualification. The text of the questions used for the initial sort were:

- Q1. Are you currently employed in or the owner or partner of a for-profit business?
- Q2. Is the U.S. the country where your organization conducts the majority of their business and/or has their headquarters AND the country in which your workplace is located?
- Q6. Which of the choices below best describes your role in your organization?

Respondents were considered qualified if they responded "*yes*" to both questions 1 and 2 and if they provided an answer to question 6. Survey question 6 was used as the basis for advanced branching; their answer to question 6 determined which of the two available paths or sets of questions would be presented to the respondent. A total of 336, or 43%, of opened surveys passed the initial filter sort as qualified respondents. Table 4.1 shows the number of cases removed at each step of the data cleaning process. Many of the potential participants were ineligible because they were either located outside the U.S. or were not currently employed in an organization.

Table 4.1

Results of Data Cleaning Process

Reason	Cases Removed	Sub-Total	Total
Responses Received			777
Ineligible Cases	441	336	
Incomplete Cases	15	321	
"Bad" Cases	1	320	
Clean Cases			320

The second review examined each response individually, identifying and removing an additional 15 responses that qualified, but upon examination were found to have only answered qualification and/or demographic questions and did not provide sufficient data for analysis. There was one additional response that was removed for inappropriate content in the narrative question under the assumption that the respondent did not participate in good faith. The two cleaning sorts left the final number of responses at 320. Responses by Mechanical Turk® workers accounted for 312, or 97.5%, of the sample.

There was variation in the number of questions any individual participant may have been asked to answer based on the number of required versus optional questions, the branching of the survey based on role, and on the answers given for certain questions with a skip logic. This is reflected in the data analysis by a varying "n" value for the different type and levels of data being analyzed. There were also some respondents who completed only the required questions; leaving the optional questions blank. Some respondents completed a portion of the required and/or optional questions and then abandoned the survey; these "partial" responses were kept in the data set as they contributed data for analysis. SPSS®, the program utilized for data analysis, by default only runs analysis on the cases that have data for the specific variable(s) being analyzed; thus, although all participants did not answer the same questions, this did not impact

data analysis. The number of valid responses for each question is identified in all tables in Chapter IV and Chapter V.

All respondents selected "*yes*" to the two filter questions asking: (a) if they were currently employed in or the owner of a for-profit business; as well as (b) if the U.S. is the country where their organization conducts the majority of its business and/or has its headquarters *and* the U.S. is also where the respondent's workplace is located. These demographic characteristics were required to be eligible for participation in the study and was established by filter questions.

Two questions asked for narrative responses for the purpose of collecting qualitative data and several questions had options for respondents to provide short additional narrative comments. Approximately 25% of respondents chose to provide additional comments when the option was available.

Recoding

Two pilot studies were conducted to test the survey questions and to familiarize the researcher with utilizing Amazon's® Mechanical Turk® platform. The survey information and a direct link to the initial pilot survey was distributed via the researcher's personal social media accounts and direct email contacts with select individuals including the Antioch University Leadership and Change Program's Survey Research Group. Once the comments were received from the first pilot study, minor wording changes to the survey were made and a second pilot study utilizing the Mechanical Turk® platform was conducted to test the viability of using Mechanical Turk® for data collection, to refine the survey questions, and to identify the best practices for launching a survey via Mechanical Turk®. The responses from cases that qualified

for the study that were received during the pilot studies were recoded to match the final version of the survey and were included in the final data analysis results.

The first pilot study utilized a different "industry" list from which participants could identify their industry than the final survey. The list of industries was increased in the survey distributed to study participants to reduce the number of responses in the *other* category and to offer a more representative list of choices to participants. The pilot study's industry list had 10 category options and *another* (please specify) category. This was increased to 14 categories for the survey. For example, the category option of *public administration/government* was removed as an option following the pilot study as the goal for the survey was to focus on for-profit organizations selling to customers. The *engineering* and *accounting/financial* categories in the pilot survey were combined into a new category of *professional, scientific,* and *business services* (accounting, legal, consulting, engineering, etc.) in the final study survey. Pilot study responses for categories that were removed or changed were recoded into the closest category in the new industry list. Pilot study responses in the other category were also recoded into an appropriate industry if one was available. Upon completion of the survey, industry responses in the category of that had a close industry category available were recoded into that category.

The Mechanical Turk® pilot study had different question text and a broader set of response options for question 3 which was designed to elicit whether the organization did business directly with the end customer. The text for survey question 3 in the Mechanical Turk® pilot study was: *Which of the following best describes your organization?* with response options 1 (*for-profit direct to customer—customer could be another organization*), 2 (*for-profit wholesale or distributor*), 3 (*not-for-profit*), 4 (*governmental entity*), 5 (*other—please specify*).

Following the Mechanical Turk® pilot study, the wording of survey question 3 was changed to: *Does this organization sell directly to the end customer? The customer could be another business*. Rewording the question allowed for simplification of the response options to 1 (*yes*) and 2 (*no*), effectively eliminating the last three categories used in the Mechanical Turk® pilot study. The research questions and planned data analyses only focused on whether an organization was for-profit selling directly to the customer or not and an additional level of detail about organizations that were not selling directly to the customer was not useful. Responses from the pilot study where options 3 (*not-for-profit*), 4 (*governmental entity*), or 5 (*other—please specify*) had been selected were recoded to the new response option of 2 (*no*).

Respondent Demographics

All survey participants were asked demographic questions to elicit information both about the participants as individuals as well as about their organization. The key piece of data collected was the participant's role within their organization as the role determined which survey questions were asked and was also used as an independent variable in data analysis. A discussion of the individual demographics, the importance of the respondent's role, and the organizational demographic information collected follows.

Role in Organization. Respondents were required to identify their role within the organization both for demographic purposes and because the respondent's role in their organization was used to group respondents into two groups – Executives and Employees. The roles of owner, partner, executive, and manager were collapsed to comprise the "Executive" group while respondents in the roles of supervisor or project/team lead, non-managerial employees, and other were recoded as the "Employee" group. Respondents were almost evenly split between the Executive group (50.9%) and the Employee group (49.1%). Table 4.2

identifies the number of original responses for each role and the results of recoding of the role into two groups for purpose of analysis.

Table 4.2

Descriptive Statistics for All Respondents: Role within Organization and Recoded Role within Organization (N=320)

Demographic		Frequency	Percent
Role	Owner	29	9.1%
	Partner	31	9.7%
	Executive	31	9.7%
	Manager	72	22.5%
	Supervisor Project/ Team Lead	56	17.5%
	Non-Managerial Employee	97	30.3%
	Other	4	1.3%
	Total	320	100.0%
Role by Analysis Group (Executive or Employee)	Executive (Owner, Partner, Executive, Manager)	163	50.9%
	Employee (Supervisor, Non-Managerial, Other)	157	49.1%
	Total	320	100.0%

Individual demographics. Table 4.3 summarizes individual demographic data for survey respondents including gender, employment status, and whether the respondent had direct contact with customers. Respondents were split almost evenly between male (50.4%) and female (48.2%), with 1.4% of respondents identifying as transgender or preferring not to specify. Gender was also almost evenly split within roles with 69 female and 68 male Executives and 66 female and 73 male Employees. Respondents were asked whether they were working full-time or part-time; 83.9% of respondents were working full-time and 16.1% were working part-time. Forty out of the 320 respondents did not indicate their gender or full- or part-time employment status.

Respondents were also asked whether they had direct contact with customers as part of the purpose of the study was to understand how frontline workers – those employees dealing directly with customers – perceive their organization's receptiveness to their ideas. This was of interest because frontline employees receive feedback related to a customer's desire for and issues with products and services; therefore, they may be in possession of information other employees would not have access to. Eighty-five percent (85%) of respondents had direct interaction with customers. More Executive respondents reported that they had direct contact with customers (90.8%) than Employee respondents (79.0%). Based on the high number of respondents who had direct contact with customers, no comparative data analyses were conducted for the differences between employees with or without direct contact statistic.

Table 4.3

Descriptive Statistics for All Respondents: Gender, Employment Status (n=280), and Direct Interaction with Customers (N=320)*

Demographic	Response	Frequency	Percent
Gender	Female	135	48.2%
	Male	141	50.4%
	Transgender	2	0.7%
	Prefer not to Answer	2	0.7%
	Total	280	100.0%
Gender by Role	Female Executive	69	51.1%
	Female Employee	66	48.9%
	Total	135	100.0%
	Male Executive	68	48.2%
	Male Employee	73	51.8%
	Total	141	100.0%
	Transgender Executive	1	50%
	Transgender Employee	1	50%
	Total	2	100.0%
Working	Full-time	235	83.9%
	Part-time	45	16.1%
	Total	280	100.0%
Working by Role	Executive Full-time	119	85.6%
	Executive Part-time	20	14.4%
	Total	139	100.0%
	Employee Full-time	116	82.3%
	Employee Part-time	25	17.7%
	Total	141	100.0%
Direct Interaction with Customers	Yes	272	85.0%
	No	48	15.0%
	Total	320	100.0%
Direct Interaction with Customers by Role	Executive Yes	148	90.8%
	Executive No	15	9.2%
	Total	163	100.0%
	Employee Yes	124	79.0%
	Employee No	33	21.0%
	Total	157	100.0%

**Note:* Forty respondents did not provide demographic information regarding gender or employment status.

Organizational demographics. The survey also contained a number of questions regarding the demographics of the organization the respondent owned or where the respondent was employed. These data are presented in Table 4.4. The purpose of the study was to better understand small and medium sized enterprises (SMEs); however, the parameters used to define an SME can vary greatly depending upon who is creating the definition. The most generous definitions range up to 1,500 employees as an upper limit for an SME, but most define an SME in terms of fewer than 500 or fewer than 250 employees. Organizations with fewer than 500 employees represented 85.8% of survey respondents.

The Organization for Economic Co-operation and Development (OECD) is an international organization of 35-member countries, including the U.S., which collects data, sets standards, and promotes policies related to economic, social, and environmental change (OECD, 2017). Much of the current research on SMEs utilizes the OECD's definition for SMEs to identify what is a small- or medium-sized enterprise. OECD identifies any enterprise with more than 250 employees as a large business (OECD, 2018).

For the purposes of this dissertation, analyses including organization size were conducted based on two size categories (< 250 employees and ≥ 250 employees) that results could be more easily compared to prior research utilizing OECD parameters while still reflecting the U.S. Small Business Administration definition of a small business which, depending upon industry, can include up to 1,500 employees (USSBA, n.d.). Based on this definition, respondents identified 71.6% of their organizations as having < 250 employees with 28.4% working in organizations with ≥ 250 or more employees.

Table 4.4

Descriptive Statistics for All Respondents: Number of Employees, Organization has Internal Research and Development Staff, and Organization is a For-Profit Organization Selling Direct to the Customer; (N=320), (N=320), and (n=258), Respectively*

Demographic	Response	Frequency	Percent
Organization Size (Number of Employees)	1-9	28	8.8%
	10-49	101	31.6%
	50-249	100	31.3%
	250-499	45	14.1%
	500+	46	14.4%
	Total	320	100.0%
Organization Size Recode (Number of Employees; OECD)	1-249	229	71.6%
	250+	91	28.4%
	Total	320	100.0%
For-Profit Direct to Customer	Yes	212	82.2%
	No	46	17.8%
	Total	258	100.0%
For-Profit Direct to Customer by Organization Size	<250 Yes	148	81.3%
	<250 No	34	18.7%
	Total	182	100.0%
	≥250 Yes	64	84.2%
	≥250 No	12	15.8%
	Total	76	100.0%
Internal Research & Development Staff	Yes	201	62.8%
	No	76	23.8%
	Don't Know/ Not Sure	43	13.4%
	Total	320	100.0%
Internal Research and Development Staff by Organization Size	<250 Yes	130	66.3%
	<250 No	66	33.7%
	Total	196	100.0%
	≥250 Yes	71	87.7%
	≥250 No	10	12.3%
	Total	91	100.0%

**Note:* Sixty-two respondents did not provide demographic information regarding type of organization.

One of the priorities of this study was to examine the perception of employees that deal directly with customers (frontline employees) regarding their organization's receptiveness to

their ideas. One survey question asked respondents to identify if their organization was one that sold products or services direct to the customer (more likely to have respondents who are frontline employees) versus a wholesaler or other organization where it is likely that an executive or employee has little to no interaction with the end customer who actually purchases and uses the product. Direct to customer organizations represent 82.2% of the 258 responses for which organization type was provided. When reviewed based on organizational size, the percentages of for-profit organizations selling direct to the customer were close, with 81.3% of organizations with < 250 employees and 84.2% of organizations with ≥ 250 employees being for-profit organizations.

A research question for the study asked where SMEs get their ideas for products and services and looked at how they leverage sources outside traditional internal research and development structures. The survey result reported in Table 4.4 showed that 62.8% organizations have internal staff to create and improve new products or services. There was a difference based on organization size regarding whether an organization had internal research and development or new product development staff. Responses differed by organization size, with 66.3% of organizations with < 250 employees and 87.7% of organizations with ≥ 250 employees having internal research staff.

Industry. A response identifying the industry to which their organization belongs was received from 281 respondents and the results are presented in Table 4.5. Respondent organizations were distributed across a wide range of industries with IT/Technology having the largest representation at 18.1%. The IT/Technology industry was represented more heavily than other industries and may reflect the use of a technology-based platform, Amazon's® Mechanical

Turk®, for data collection. The disbursement and lack of a significantly dominant industry precluded further industry-level analysis in this study.

Table 4.5

Descriptive Statistics for All Respondents: Industry (n=281)

Industry	Frequency	Percent
Manufacturing	31	11.0%
Retail	29	10.3%
Consumer Products	29	10.3%
Healthcare	21	7.5%
Hospitality & Tourism/ Travel	7	2.5%
Professional, Scientific, & Business Services	31	11.0%
Financial Services/Banking	14	5.0%
IT/Technology	51	18.1%
Restaurant/Food Service	14	5.0%
Arts/Entertainment/Sports	15	5.3%
Personal & Home Services	10	3.6%
Education	15	5.3%
Agriculture/Forestry	1	.4%
Other	13	4.6%
Total	281	100.0%

**Note:* Thirty-nine respondents did not provide demographic information regarding industry.

Research Question 1

Research Question 1 asked one main question and one sub-question: *To what extent do executives and employees in SMEs perceive that their organization engages in open innovation? Where do ideas for new or improved products and services originate in SMEs?*

Survey questions addressing this research question asked the Executives and Employees about the frequency their organization engages in open innovation activities. Executives were also asked if their organization was currently developing new or improved products and services, the sources of ideas for new and improved products and services, and the motivation for their organization to engage in open innovation. The category of Executives included the roles of

owner, partner, executive, and manager. The Employees' category included the roles of supervisor or project/team leader and non-managerial employee.

New and improved product and service development. Executive group respondents were asked to identify whether their organization was currently engaged in developing and/or selling new or improved products and services. Of the 163 Executive respondents answering the question, as shown in Table 4.6, 51.5% were currently developing new or selling improved products or services implying that almost half of organizations had not been developing or improving their products and services in the recent past. Respondents answering "*no"* to this question did not receive follow-up questions regarding their organization's engagement in open innovation activities as the purpose of the questions was to identify organizations currently engaging in open innovation activities to develop new products and services.

Table 4.6

Descriptive Statistics for Q8 Executive Respondents: Has your organization developed any new products or services or begun selling any improved products or services in the last few years? (n=163)

Response	Frequency	Percent
Yes	84	51.5%
No	67	41.1%
Don't Know/Not Sure	12	7.4%
Total	163	100.0%

Respondents who answered *no* to the question as to whether their organization had recently been developing products did not receive the next question for Executives which asked them to identify the type of new or improved products or services their organization was developing. Respondents that responded *yes* to this question were asked an optional open-ended narrative follow-up question regarding the type of new and improved products or services their organization was developing. The 56 comments provided were approximately evenly split

between the development of products and services; comments regarding improvement of organizational processes were considered services for analysis. Examples of the new and improved products and services being developed included: software applications, cosmetics, arts education, medical devices, and consulting services.

Source of ideas. Respondents from the Executive group who answered *yes* to whether their organization was currently engaging in developing new or improved products or services were asked to identify whether their organization 1 (*never*), 2 (*rarely*), 3 (s*ometimes*), 4 (*fairly often*), or 5 (*most of the time*) obtained ideas for new products and services from a list of possible sources. Mean scores for this question, as shown in Table 4.7, ranged from 2.99 to 3.59. Executive respondents felt that the entrepreneur/owner (M = 3.59) was the greatest source of ideas for the organization. The next three most important sources of ideas based on mean scores were employees (M = 3.55), executives (M = 3.49), and customers (M = 3.43).

Those four idea sources, although in a slightly different rank order, also had the highest combined percentage of *fairly often* or *most of the time* responses with the entrepreneur/owner (60.3%) first, followed by executives (53%), employees (50.6%), and customers (50.6%). Universities (M = 2.99) were identified as the least likely source of ideas for an organization. Respondents indicated their organizations never utilized universities (20.5%), public or governmental organizations (20.5%), online idea/innovation platforms (14.5%), or crowdsourcing (14.5%) as a source of ideas for new or improved products and services.

Table 4.7

Descriptive Statistics for Q10 Executive Respondents: Source of Ideas for New and Improved Products and Services (n=83)

Statements	*M*	*SD*	Never	Rarely	Sometimes	Fairly Often	Most of the Time
Entrepreneur/ Owner	3.59	1.09	4.8%	12.0%	22.9%	39.8%	20.5%
Employees	3.55	1.00	1.2%	13.3%	34.9%	30.1%	20.5%
Executives	3.49	1.09	3.6%	15.7%	27.7%	33.7%	19.3%
Customers	3.43	.94	2.4%	13.3%	33.7%	39.8%	10.8%
Competitors	3.29	1.08	7.2%	15.7%	27.7%	39.8%	9.6%
Consultants	3.17	1.21	13.3%	12.0%	32.5%	28.9%	13.3%
Suppliers	3.16	1.15	10.8%	14.5%	34.9%	27.7%	12.0%
Online Idea/Innovation Platform	3.07	1.19	14.5%	15.7%	25.3%	37.3%	7.2%
Public or Governmental Organizations	3.04	1.32	20.5%	10.8%	25.3%	31.3%	12.0%
Crowdsourcing	3.02	1.24	14.5%	20.5%	24.1%	30.1%	10.8%
Universities	2.99	1.33	20.5%	15.7%	19.3%	33.7%	10.8%

An independent-samples t-test was conducted to see if there were any differences in source of ideas between organizations with < 250 employees or organizations with ≥ 250 employees; no significant differences in source of ideas was found based on the size of the organization.

Open Innovation

There were multiple questions on the survey to identify the level and type of engagement in inbound open innovation within an organization. Table 4.8 reflects the results when both

Executives (*M* = 2.96) and Employees (*M* = 3.09) were asked "…how frequently does your organization engage in inbound open innovation activities when creating new or improving existing products or services" as a measure of how often organizations engage others beyond internal research and development resources for acquiring new ideas. Only 8.8% of respondents indicated that their organization never utilized open innovation with 70.3% indicating that their organization *sometimes* to *very often* engaged in open innovation activities. Employees had a sixth response to select from *Don't Know/Not Sure*; these ten responses were excluded from the Employee group for the purpose of this analysis.

Table 4.8

Descriptive Statistics for Q13 Executive Respondents and Q18 Employee Respondents: Frequency Organization Engages in Open Innovation Activities; (n=146) and (n=137), Respectively

Group	*M*	*SD*	Never	Rarely	Sometimes	Fairly Often	Very Often
Executives	2.96	1.08	10.3%	21.2%	38.4%	22.6%	7.5%
Employees	3.09*	1.10*	7.3%	20.4%	40.9%	18.2%	13.1%

**Note:* Employees had a sixth option of "Don't Know/Not Sure; calculated values do not include those 10 responses.

An independent-samples t-test was conducted to compare Executive and Employee responses regarding frequency of engagement in open innovation activities to identify if there was a difference in perception of their organization's open innovation activities between Executives and Employees. No significant differences were found between the Executives (*M* = 2.96, *SD* = 1.08) and Employees (*M* = 3.09, *SD* = 1.10). These similar close to *sometimes* responses for both Executives and Employees show that respondent role did not have a

significant effect on the perception that organizations engaged in some open innovation activities.

The Executive group was asked, as a follow-up question, what their organization's motivation was for engaging in open innovation activities. Responses indicated that close to or over half of the survey executive respondents felt their organizations engaged in open innovation for each of the motivations provided as statements in the survey question. The results for this question are shown in Table 4.9. The mean scores for this question varied from 4.30 to 4.62, falling between *somewhat agree* and *agree.* The statement "to identify new business opportunities" had the highest mean score (4.62) with 63.5% of respondents selecting *agree* (46.0%) or *strongly agree* (17.5%). The next three highest mean scores were: "to solve problems" (4.60), "to increase efficiency" (4.59), and "to keep up with competition" (4.57). These statements also had the three highest percentages of *strongly agree* responses that their organizations had these reasons for engaging in open innovation activities—21.0%, 23.2%, and 19.2%, respectively.

The three least likely reasons why organizations chose to engage in open innovation were: "to reduce the cost of new product or service development" and "to involve non-research and development employees in product development and improvement;" both statements had a mean score of 4.30.

Respondents who answered *other (specify)* to the question were provided with a comment box to elucidate what other reasons they had for engaging in open innovation. Three responses identified "money" or "profit" as a reason for engaging in open innovation.

Other reasons included:

- "To keep the organization afloat, one must continually innovate."

- “Sometimes a fresh set of eyes can bring more to the table in terms of innovation than those of us who have been focused on the market for so long.”
- “We always value a fresh input (without preconceived notions) in our idea generation process.”
- “Increase our speed to market new innovations/technologies. Create disruption in the market.”

Table 4.9

*Descriptive Statistics for Q14 Executive Respondents: Motivation for Engaging in Open Innovation (n=124 to 126)**

Statements	*M*	*SD*	Strongly Disagree	Disagree	Disagree somewhat	Agree somewhat	Agree	Strongly agree
To identify new business opportunities	4.62	1.06	1.6%	2.4%	9.5%	23.0%	46.0%	17.5%
To solve problems	4.60	1.08	0.0%	5.6%	8.1%	27.4%	37.9%	21.0%
To increase efficiency	4.59	1.15	0.8%	5.6%	8.8%	26.4%	35.2%	23.2%
To keep up with competition	4.57	1.09	0.8%	4.0%	11.2%	24.8%	40.0%	19.2%
To develop products or services that the organization cannot develop with its own resources	4.43	1.13	0.8%	4.8%	13.5%	31.7%	30.2%	19.0%
To optimize use of non-research and development employee talents, knowledge, and initiative	4.39	1.12	1.6%	5.6%	11.1%	29.4%	38.9%	13.5%
To reduce the cost of new product or service development	4.30	1.23	2.4%	5.6%	15.9%	30.2%	27.8%	18.3%
To involve non-research and development employees in product development and improvement	4.30	1.12	2.4%	4.0%	13.7%	32.3%	36.3%	11.3%
Other	3.56	1.67	22.1%	3.2%	14.7%	24.2%	25.3%	10.5%

**Note:* Respondents were not required to provide an answer to all options; therefore, the number of responses to each question varied between 124 and 126.

Table 4.10 shows executive respondents indicated that 97.6% of their organizations either formally or informally had open innovation as part of the organization's business model and thusly core strategy and activities. More than half of Executives (59.5%), responded that open innovation was a formal part of their organization's business model, indicating that open innovation was a key strategy for the organization.

Table 4.10

Descriptive Statistics for Q15 Executive Respondents: Is Open Innovation a Formal or Informal Part of Your Organization's Business Model? (n=126)

Part of Business Model	Frequency	Percent
Formal part	75	59.5%
Informal part	48	38.1%
Not Part	3	2.4%
Total	126	100.0%

Research Question 2

Research Question 2 asked: *How do executives and employees perceive their organization's receptiveness to employee ideas for new or improved products or services and what barriers does each group perceive to sharing or implementing those ideas?* Survey questions addressing this research question consisted of two matrix questions, with a total of 19 statements, asking for Executive and Employee perceptions of the organization's receptiveness to new ideas and the processes used for handling open innovation.

Perception of organization's processes for open innovation. Respondents were asked to respond to statements constructed to solicit the Executive and Employee groups' perception of their organization's receptiveness to ideas and the process for handling ideas. Tables 4.11 and 4.12 contain the means, standard deviation, and percentage distributions for both the Executive and Employee group responses to the first of the two perception matrix questions.

Executive perception of organization's processes for open innovation. The mean scores for the Executive responses to the statements in the perception of organization's processes for open innovation question highlighted in Table 4.11 ranged from 3.76 to 4.41 with only two of the ten statements having a mean score below 4.0. The highest mean score of 4.41 was for "communicates about and solicits ideas from employees to solve problems within the organization." Similarly, this statement also had the highest percentage of combined *somewhat agree*, *agree,* and *strongly agree* responses at 86.1%. The lowest mean score of 3.76 was for "…has a formal process for employees to submit their ideas for new products and services (online submission form, written process) that is clearly communicated to employees."

Comparing the statements with the highest mean scores and those that received the highest percentage of *strongly agree* responses, there is a distinct difference between the mean scores and percentages. The statement with the highest *strongly agree* percentage of 29.1% was "...provides employees with time to work on ideas outside of their normal job duties;" this statement had the second to lowest mean score of 3.96.

While only 7.6% of Executives answered *strongly agree* that their organization had a formal process for employees to share their ideas, the combined *somewhat agree, agree,* and *strongly agree* responses indicated that 65.2% of organizations had some level of a formal process.

Table 4.11

Descriptive Statistics for Q11 Executives Respondents: Perception of Organization's Processes for Open Innovation(n=158)

Statements	*M*	*SD*	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
a. ...has a formal process for employees to submit their ideas for new products and services (online submission form, written process) that is clearly communicated to employees	3.76	1.55	14.6%	9.5%	10.8%	23.4%	34.2%	7.6%
b. ...has an informal process for employees to share their ideas for new products and services	4.25	1.30	3.2%	7.6%	14.6%	27.8%	29.1%	17.1%
c. ...communicates about and solicits ideas from employees to solve problems within the organization	4.41	1.08	2.5%	3.2%	8.2%	35.4%	38.0%	12.7%
d. ...empowers employees to share their ideas to innovate products and services	4.39	1.17	2.5%	3.8%	14.6%	25.9%	38.0%	15.2%
e. ...provides employees with time to work on ideas outside of their normal job duties	3.96	1.39	7.0%	10.1%	15.2%	27.2%	27.2%	29.1%
f. ...provides training to employees to improve their ability to generate and implement ideas	4.09	1.37	6.3%	7.6%	15.2%	25.3%	32.3%	13.3%
g. ...provides resources for employees to pursue ideas	4.06	1.34	6.3%	7.0%	15.8%	27.8%	31.0%	12.0%
h. ...provides incentives for employees to share ideas	4.22	1.36	6.3%	5.7%	11.4%	30.4%	29.1%	17.1%
i. ...recognizes and rewards employees who contribute ideas that are implemented	4.22	1.27	4.4%	6.3%	12.7%	28.5%	35.4%	12.7%
j. ...accepts failure when testing new ideas for products and services	4.27	1.22	3.2%	6.3%	13.3%	27.8%	36.7%	12.7%

Employee perception of organization's processes for open innovation. The questions on the perception of organization processes for open innovation for Employees (Q16) contained statements that were identical to those for the Executives (Q11). The mean scores for the statements for Employees as shown in Table 4.12 ranged from 3.31 to 4.10 with only three of the ten statements having a mean above 4.00. Comparatively, the Executive responses had mean scores above 4.00 for eight of the ten statements. The statement with the highest mean score of 4.10 for Employees was "…empowers employees to share their ideas to innovate products and services." The lowest mean score for Employees of 3.31 was for "…has a formal process for employees to submit their ideas for new products and services (online submission form, written process) that is clearly communicated to employees." The second to lowest mean score of 3.39 was for "...provides incentives for employees to share ideas."

In alignment with the mean scores, the statement that received the highest percentage of *strongly agree* responses from Employees at 17.2% was "...empowers employees to share their ideas to innovate products and services." Similarly, in alignment with the mean score results, the statement "…has a formal process for employees to submit their ideas for new products and services (online submission form, written process) that is clearly communicated to employees" had the highest combined percentage of *strongly disagree, disagree, and somewhat disagree* responses at 49.7%. Thus, almost half of Employee respondents perceived that their organization had no formal process for submitting employee ideas.

Perception of organization's receptiveness to open innovation. The matrix questions about the respondent perception of their organization's receptiveness to open innovation also contained identical statements for Executives (Q12) and Employees (Q17).

Table 4.12

Descriptive Statistics for Q16 Employee Respondents: Perception of Organization's Processes for Open Innovation (n=157)

Statements	*M*	*SD*	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
a. ...has a formal process for employees to submit their ideas for new products and services (online submission form, written process) that is clearly communicated to employees	3.31	1.62	17.8%	21.7%	10.2%	19.1%	24.2%	7.0%
b. ...has an informal process for employees to share their ideas for new products and services	4.05	1.37	5.1%	12.1%	12.1%	25.5%	33.8%	11.5%
c. ...communicates about and solicits ideas from employees to solve problems within the organization	4.02	1.43	8.3%	8.9%	11.5%	27.4%	31.8%	12.1%
d. ...empowers employees to share their ideas to innovate products and services	4.10	1.39	7.0%	5.7%	15.3%	31.2%	23.6%	17.2%
e. ...provides employees with time to work on ideas outside of their normal job duties	3.48	1.49	11.5%	17.2%	20.4%	23.6%	17.8%	9.6%
f. ...provides training to employees to improve their ability to generate and implement ideas	3.82	1.59	14.0%	8.9%	12.1%	23.6%	28.7%	12.7%
g. ...provides resources for employees to pursue ideas	3.66	1.53	13.4%	11.5%	15.3%	25.5%	24.8%	9.6%
h. ...provides incentives for employees to share ideas	3.39	1.56	15.9%	16.6%	15.3%	27.4%	14.6%	10.2%
i. ...recognizes and rewards employees who contribute ideas that are implemented	3.75	1.54	12.7%	10.8%	14.6%	22.3%	29.9%	9.6%
j. ...accepts failure when testing new ideas for products and services	3.87	1.38	9.6%	5.7%	17.2%	32.5%	25.5%	9.6%

Table 4.13 and Table 4.15 show the means, standard deviation, and percentage distributions for both the Executive and the Employee responses. Tables 4.14 and 4.16 identify narrative themes and provide sample quotes from Executives and Employees. Employees were also asked to discuss their personal experiences with idea sharing and the experiences of their fellow employees. Table 4.17 shows the frequency of employee idea sharing activities while Tables 4.18 and 4.19 identify narrative themes and provide sample quotes from Employees regarding idea sharing.

Executive perception of organization's receptiveness to open innovation. The mean scores for Executive responses regarding perceptions of organization's receptiveness to open innovation statements ranged from 3.93 to 4.62 as shown in Table 4.13. The statement "employees have good quality ideas to share" had the highest mean score of 4.62 followed by "employees have sufficient knowledge of customers and customer needs to provide relevant ideas" at 4.59. The lowest mean score of 3.93 was for the statement "ownership of an idea (intellectual property rights) is a concern when employees share ideas." The second to lowest mean for Executive respondents was 4.32 for the "employee ideas shared with the organization are often implemented" statement. The two statements with the highest mean scores also had the highest percentage of *strongly agree* responses at 24.5% and 25.0%, respectively. The combined *somewhat agree, agree,* and *strongly agree* percentages ranged from 82.3% to 84.4% for seven of the nine statements with only two of the statements with the lowest mean scores—"employee ideas shared with the organization are often implemented" (79.6%) and "ownership of an idea (intellectual property rights) is a concern when employees share ideas" (68.0%)—falling below 80%.

Table 4.13

*Descriptive Statistics for Q12 Executive Respondents: Perception of Organization's Receptiveness to Open Innovation (n=147-148)**

Statements	*M*	*SD*	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
a. Top management communicates a shared vision for the organization to employees	4.49	1.08	2.0%	3.4%	10.1%	25.0%	46.6%	12.8%
b. Top management communicates the organization's strategy to employees	4.52	1.17	2.0%	5.4%	8.2%	25.2%	40.8%	18.4%
c. Employees are interested in sharing ideas to improve our products and/or services	4.45	1.17	2.0%	6.1%	9.5%	25.7%	40.5%	16.2%
d. Employees have good quality ideas to share	4.62	1.15	1.4%	3.4%	11.6%	23.8%	35.4%	24.5%
e. Employees have sufficient knowledge of the market and competitors to provide relevant ideas	4.40	1.13	1.4%	5.4%	10.8%	33.1%	33.1%	16.2%
f. Employees have sufficient knowledge of customers and customer needs to provide relevant ideas	4.59	1.19	1.4%	4.7%	11.5%	23.0%	34.5%	25.0%
g. In my experience, once an idea is submitted an employee receives feedback on the idea	4.44	1.17	2.7%	3.4%	11.6%	28.6%	36.7%	17.0%
h. Employee ideas shared with the organization are often implemented	4.32	1.20	3.4%	5.4%	11.6%	27.9%	38.8%	12.9%
i. Ownership of an idea (intellectual property rights) is a concern when employees share ideas	3.93	1.47	9.5%	9.5%	12.9%	27.9%	27.2%	12.9%

**Note:* Respondents were not required to respond to every statement so the N for each statement varies between 147 and 148.

Executive narrative comments about perception of organization's receptiveness to open innovation. A comments box asking "what, if any, other thoughts do you have about how idea sharing works in your organization?" was included after the perception of organization's receptiveness to open innovation matrix for both Executives (Q12) and Employees (Q17).

The top five Executive themes identified based on the number of times the theme was mentioned in a comment were: idea sharing is encouraged, idea sharing is not encouraged, there is no incentive or too little incentive for idea sharing, there are incentives and recognition for sharing ideas, and ideas are proposed to management but then nothing happens. Table 4.14 identifies the themes and includes a quote selected from responses with that theme for illustration.

There were 13 comments with the theme of idea sharing is encouraged; the other four themes had three comments each specifically discussing that theme. In addition to the representative quotes for each of the themes provided in Table 4.14 there were three respondents who shared additional comments reflecting the range of different perspectives held by the Executives:

- "Knowledge sharing is essential for a company to achieve success, since it can facilitate decision-making capabilities."
- "It usually isn't worth the headache, because it just adds work to my overloaded day. There is no benefit for me to take on new responsibilities."
- "I believe there are more ideas out there but most of the employees keep the ideas to themselves to be able to start working for themselves instead of using them to help build up the company."

These responses show the value of knowledge sharing to organizations as well as the internal barriers that may be preventing employees from sharing ideas with their organization.

Table 4.14

Narrative Themes and Representative Quotes Q17 Executive Respondents: Perception of Organization's Receptiveness to Open Innovation

Main Themes	Representative Response Quote
Idea sharing is encouraged	*Our organization is very informal and ideas are discussed freely as the need arises or they come up. There is no formal process.*
Idea sharing is not encouraged	*My company does not encourage this and certainly does not incentivize it.*
No incentives or recognition for ideas	*When ideas are shared and implemented, many times there is no recognition or even payment for bringing in extra business. Bonuses are also non-existent.*
Receive incentives and recognition for ideas	*The incentive scheme is generous as it allows the employee to get a share of the profits once the idea is accepted and implemented upon.*
Ideas proposed to management and then nothing happens	*When ideas get shared to upper management that is literally where the idea goes and it does not go any further.*

Employee perception of organization's receptiveness to open innovation. The mean scores for the Employee responses for the perception of their organization's receptiveness to open innovation question, shown in Table 4.15, ranged from 3.36 to 4.76. The statement with the highest mean of 4.76 was "employees have sufficient knowledge of customers and customer needs to provide relevant ideas." The second highest mean score was for "employees have good quality ideas to share" at 4.53. The lowest mean score of 3.36 was received for "ownership of an idea (intellectual property rights) is a concern when employees share ideas."

The statement that received the highest percentage of *strongly agree* responses from Employees at 20.4% was “employees are interested in sharing ideas to improve our products and/or services” (*M* = 4.30) followed closely by the statement “employees have good quality ideas to share” (*M* = 4.53) and “employees have sufficient knowledge of customers and customer needs to provide relevant ideas” (*M* = 4.76) both with 19.7% *strongly agree.*

The combined *somewhat agree, agree,* and *strongly agree* percentages ranged from 46.9% for the statement “ownership of an idea (intellectual property rights) is a concern when employees share ideas” to 91.1% for the statement “employees have sufficient knowledge of customers and customer needs to provide relevant ideas.”

Table 4.15

Descriptive Statistics for Q17 Employee Respondents: Perception of Organization's Receptiveness to Open Innovation (n=147)

Statements	*M*	*SD*	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
a. Top management communicates a shared vision for the organization to employees	4.21	1.38	7.5%	6.1%	8.2%	29.3%	34.0%	15.0%
b. Top management communicates the organization's strategy to employees	4.18	1.44	8.2%	8.2%	6.8%	26.5%	35.4%	15.0%
c. Employees are interested in sharing ideas to improve our products and/or services	4.30	1.36	6.1%	3.4%	13.6%	28.6%	27.9%	20.4%
d. Employees have good quality ideas to share	4.53	1.18	3.4%	3.4%	6.1%	30.6%	36.7%	19.7%
e. Employees have sufficient knowledge of the market and competitors to provide relevant ideas	4.48	1.14	2.7%	4.1%	8.8%	25.2%	44.9%	14.3%
f. Employees have sufficient knowledge of customers and customer needs to provide relevant ideas	4.76	1.03	1.4%	4.1%	3.4%	19.7%	51.7%	19.7%
g. In my experience, once an idea is submitted an employee receives feedback on the idea	3.94	1.43	7.5%	10.2%	16.3%	25.9%	27.2%	12.9%
h. Employee ideas shared with the organization are often implemented	3.70	1.41	8.2%	13.6%	20.4%	23.1%	27.2%	7.5%
i. Ownership of an idea (intellectual property rights) is a concern when employees share ideas	3.36	1.63	17.7%	16.3%	19.0%	15.6%	21.8%	9.5%

Employee perception of organization's receptiveness to open innovation narrative comments. Similar to Executives, the top five Employee narrative themes identified from the Employee comments were: idea sharing is encouraged, idea sharing is not encouraged, there are no incentives or recognition for idea sharing, there is no process for ideas sharing, and ideas are proposed to management but then nothing happens. Table 4.16 identifies the themes and includes a quote selected from responses that illustrates the theme.

Table 4.16

Narrative Themes and Representative Quotes Q17 Employee Respondents: Perception of Organization's Receptiveness to Open Innovation

Main Themes	Representative Response Quote
Idea sharing is encouraged	*Ideas and opinions are shared very openly and informally within my workplace. There are no formal procedures for sharing ideas, and we are often encouraged to come up with creatives solutions. Employees share ideas with each other more often than they share them with upper management.*
Idea sharing is not encouraged	*In my organization we employees do not have to really share ideas. It is our job to implement the ideas of corporate (which is in another location). There are times when we can implement our own logistics…but these are much smaller moments.*
No incentive or recognition for idea sharing	*There is a tendency to pretend an idea is bad, sit on it, and then implement it without giving the person who came up with it any credit.*
Ideas proposed to management and then nothing happens	*There is no official process but ideas are shared during team meetings. Good ideas will be pushed up the food chain. It's rare that we ever hear about it after that, although it is possible that the idea will be worked on and implemented.*
No organizational process for idea sharing	*A lot of times I'll have an idea on how to make something we do more efficient but I hesitate to share it because there simply is no simple process or incentive.*

There were 22 comments with the theme of idea sharing is encouraged. The majority of comments indicated that idea sharing was done only as an informal activity rather than as part of a formal process. There were seven comments stating that idea sharing was not encouraged, there were four comments regarding no incentives or recognition for sharing ideas, and the other three themes had three comments each specifically discussing that theme. The theme of receiving incentives and recognition for ideas, which was identified in the top five Executive themes, was also mentioned by Employees in two comments.

In addition to the representative quotes for each of the themes provided in Table 4.16 there were three respondents who shared comments reflecting the range of perspectives held by the Employees:

- "Employees would love to share ideas and have had some great ideas. But the company is set on doing things ONLY their way. This company has a hard time keeping good employees."
- "Idea sharing only works in my organization when someone wants to go above and beyond their job description. It is internally generated, and thus only happens rarely."
- "Our employees have great ideas and an eagerness to share. However, while management says they are open to employee ideas, they almost never try to develop or implement the ideas. Unfortunately, little changes as a result, and then employees start getting discouraged from even trying. Even when ideas do get implemented, management takes the credit and the employee gets no reward or recognition. It's a shame because I work with so many talented people and it seems the talent goes to waste."

These responses identify internal individual and organizational barriers that may be preventing employees from sharing ideas with their organization.

Results of employee idea sharing experiences. In addition, to how employees perceived their organizations' receptiveness to ideas, the study sought to explore what happens when an employee actually shares an idea with their organization. What was their actual experience? Employees were asked if they had ever personally shared an idea with their organization (Q19) or if they knew of a fellow employee who had shared an idea (Q21). About half (51.7%) of Employees had personal experience with idea sharing and slightly more than one-third (37.3%) of employees knew a fellow employee who had shared an idea; 60.8% of Employees either had shared or knew of someone who had shared an idea. The frequency of idea sharing is shown in Table 4.17. In addition, Employees were asked narrative questions regarding what happened once they (Q22) or their fellow employee (Q24) shared their idea. A Chi-square test showed no significant difference in the frequency of employee idea sharing based on organizational size.

Table 4.17

Descriptive Statistics for Q19 and Q21 Employee Respondents: Personal and Fellow Employee Idea Sharing (n=143) and (n=142), Respectively

Demographic	Response	Frequency	Percent
Employee	Yes	74	51.7%
	No	69	48.3%
	Total	143	100.0%
Fellow Employee	Yes	53	37.3%
	No	35	24.6%
	Don't Know/ Not Sure	54	38.0%
	Total	142	100.0%

The first follow-up narrative question was: *If you personally shared your idea for a new or improved product or service with your organization, please describe what happened. For example, who did you share the idea with, how was the idea received, did you receive feedback, was the idea implemented, etc.?* There were three main themes drawn from the narrative data. Table 4.18 shows Employee narrative responses regarding their personal experience with sharing ideas with their organization: the idea was implemented, their idea was not welcome, and the idea was received by an upper level of management but went nowhere.

Table 4.18

Narrative Themes and Representative Quotes Q20 Employee Respondents: Personal Idea Sharing Experiences

Main Themes	Representative Response Quote
Idea was implemented	*I first shared by idea with members of my team. They provided guidance and helped me work out details. After I felt confident in what I had developed, I brought the idea to my direct supervisor. He altered minor details, but my organization ended up implementing the idea.*
Idea was not welcome	*I brought up an idea during a meeting. I was told it wasn't my area of expertise. I was angry for quite a while afterwards. Then a few months later we get a memo saying that they were making the change I suggested. Of course, my name was nowhere on that memo. It hasn't happened just to me either.*
Ideas proposed to management and then nothing happens	*There is no official process but ideas are shared during team meetings. Good ideas will be pushed up the food chain. It's rare that we ever hear about it after that, although it is possible that the idea will be worked on and implemented.*

There were 29 comments indicating that the employee's idea was implemented; however, many of the ideas that were identified as implemented were process improvements on the

internal operations of the organization rather than an idea for a new or improved product or service that would be sold to customers.

Eight respondents were told or made aware that their idea was not welcome, and seven respondents had their idea considered by a level of management above them but they had heard nothing back regarding their idea.

Employee respondents provided additional comments that reflect the actual or perceived result of employees sharing their ideas with their organization. These comments illustrate organizational barriers that may be preventing employees from sharing ideas with their organization or for employee ideas to be implemented. These included:

- "I shared the idea with my direct supervisor, the idea was well-received and together we shared it with his supervisor. That supervisor gave positive feedback and the idea was implemented with a few small changes that we all discussed and agreed upon."
- "The idea was implemented (it was a variation on a product we already make…) and I was given a bonus and a raise."
- "I had an idea for marketing…the idea went over well, but a fellow male coworker tried to take credit and also change my idea, not improve it. It blew up and the owner of the company took the project from me. It was frustrating."
- "We had a "turnaround consultant" who came in and solicited any and all ideas. I eagerly shared about a dozen ideas and volunteered to work on them if the company proceeded with them. Many of my coworkers did the same. Ultimately, management ignored most of our suggestions. I got no credit, reward, or thanks. Management decided to try their own ideas which did turn the company around financially, but has not made a bit of impact on improving their culture or their product. I have given up trying

to help them and am actively looking for a new job. They had a chance to engage me and make me feel part of their success, but instead they've made me want to leave."

Employees were also asked a second follow-up narrative question regarding their fellow employees' experience with idea sharing: *If you are aware of a fellow employee sharing an idea for a new or improved product or service with your organization, please describe what happened. For example, who did they share their idea with, how was their idea received, did they receive feedback, was the idea implemented, etc.?* The three main themes identified from the Employee narrative responses regarding their personal experience with sharing ideas with their organization were the same themes identified when they discussed the idea sharing experiences of their fellow employees illustrated in Table 4.19: the idea was implemented, their idea was not welcome, and the idea was received by an upper level of management but has gone nowhere. There were 17 comments indicating that their fellow employee's idea was fully or partially implemented. Most of the examples provided for ideas that were implemented reflected process improvements to the internal operations of the organization.

Nine respondents indicated that their fellow employee was told or made aware that their idea was not welcome, and three knew someone that had their idea considered by a level of management above them, but they had heard nothing back regarding the idea. Respondents provided additional comments that reflect the actual or perceived result of employees sharing their ideas with their organization. Table 4.19 identifies the themes and provides quotes illustrating the themes.

Additional comments from Employee regarding their experiences with sharing ideas illustrate organizational barriers that may be preventing employees from sharing ideas with their organization or for employee ideas to be implemented.

- "The employee was willing to share his idea with us (his coworkers), but he didn't want to bring it to management. Instead, we as a group brought up the idea during a meeting, and the entire team received credit. The idea was partially implemented."
- "A fellow employee shared an idea with our supervisor, who was hesitant to approach his supervisor until our group made some changes. We discussed it as a team and took the finished product to upper management where it was approved and implemented."
- "Several employees have had ideas for products, and at least 5 have seen their product ideas implemented."

Table 4.19

Narrative Themes and Representative Quotes Q22 Employee Respondents: Fellow Employee Idea Sharing Experiences

Main Themes	Representative Response Quote
Idea was implemented	*He spoke to our manager about it, the manager listened and approved the recommendation and initiated its implementation. The fact that he approved it was his way of saying it was a good idea.*
Idea was not welcome	*They shared their idea with the corporate people in the building that day. They said it was a good idea, but wouldn't work. They offered no other feedback as to why.*
Ideas proposed to management and then nothing happens	*The idea was shared with my boss in a staff meeting, and he said that liked the idea and would pass it up the chain. That was the last we heard of it.*

Research Question 3

Research question 3 had one main question and one sub-question that asked: *How do executives and employees differ in their perception of the organization's receptiveness to employee ideas and the barriers that exist to sharing and implementing employee ideas as part*

of the open innovation process? How does organization size affect open innovation activities and perception of innovation processes and activities?

Perception of organization's processes for open innovation (Q11 and Q16) and perception of organization's receptiveness to open innovation (Q12 and Q17) asked Executives and Employees about their perception of their organization's receptiveness to open innovation. Results of the questions were analyzed using independent samples t-tests to identify statistically significant differences of perception between Executives and Employees.

A comparative analysis of both perception of an organization's processes for open innovation and the perception of an organization's receptiveness to open innovation were conducted based on organization size. Results of these questions were analyzed by Chi-square tests to identify statistically significant differences in perception based on organization size.

Comparative analysis of processes for open innovation by role. A comparison of the Executive and Employee means for each perception of organization's processes statement for open innovation (Q11 and Q16) in Table 4.20 shows a significantly higher mean for the Executive group (M =4.41) versus the Employee group (*M* =4.10). This suggests that Executives were more likely than Employees to agree that their organization had each of the policies and processes related to open innovation. Seven of the ten statements in this question had statistically significant differences between Executives and Employees in an independent-samples t-test.

There was a statistically significant difference between Executives (*M* = 3.76, *SD* = 1.55) and Employees (*M* = 3.31, *SD* = 1.62) for the statement "…has a formal process for employees to submit their ideas for new or improved products and services (e.g. online submission form, suggestion box, written process) that is clearly communicated to employees," with t(313) = 2.50,

$p<.05$. There was a statistically significant difference between Executives ($M = 4.41$, $SD = 1.08$) and Employees ($M = 4.02$, $SD = 1.43$) for the statement "…communicates about and solicits ideas from employees to solve problems within the organization," with $t(290) = 2.75$, $p<.01$. The differences in these two statements suggests that Executives perceive that they are actively soliciting ideas from employees to a greater degree than Employees.

There was a statistically significant difference between Executives ($M = 3.96$, $SD = 1.39$) and Employees ($M = 3.48$, $SD = 1.49$) for the statement "…provides employees with time to work on ideas outside of their normal job duties," with $t(313) = 2.94$, $p<.01$. There was a statistically significant difference between Executives ($M = 4.06$, $SD = 1.34$) and Employees ($M = 3.66$, $SD = 1.53$) for the statement "…provides resources for employees to pursue ideas," with $t(307) = 2.51$, $p<.05$. These two results suggest that Executives believe they are providing resources to employees while Employees are perceiving far less resource support for working on and pursuing ideas.

There was a statistically significant difference between Executives ($M = 4.22$, $SD = 1.36$) and Employees ($M = 3.39$, $SD = 1.56$) for the statement "…provides incentives for employees to share ideas," with $t(307) = 5.00$, $p<.001$. There was also a statistically significant difference between Executives ($M = 4.22$, $SD = 1.27$) and Employees ($M = 3.75$, $SD = 1.54$) for the statement "…recognizes and rewards employees who contribute ideas that are implemented," with $t(301) = 3.00$, $p<.01$. The results of these two analyses suggests that Executives believe that they are providing incentives and rewards to employees to a greater degree than perceived by employees.

Table 4.20

Comparison of Means Q11 Executive Respondents and Q16 Employee Respondents: Perception of Organization's Processes for Open Innovation (n=315)

Statements	*Executive M n=158*	*Employee M n=157*
a. ...has a formal process for employees to submit their ideas for new products and services (online submission form, written process) that is clearly communicated to employees	3.76	3.31*
b. ...has an informal process for employees to share their ideas for new products and services	4.25	4.05
c. ...communicates about and solicits ideas from employees to solve problems within the organization	4.41	4.02**
d. ...empowers employees to share their ideas to innovate products and services	4.39	4.10
e. ...provides employees with time to work on ideas outside of their normal job duties	3.96	3.48**
f. ...provides training to employees to improve their ability to generate and implement ideas	4.09	3.82
g. ...provides resources for employees to pursue ideas	4.06	3.66*
h. ...provides incentives for employees to share ideas	4.22	3.39***
i. ...recognizes and rewards employees who contribute ideas that are implemented	4.22	3.75**
j. ...accepts failure when testing new ideas for products and services	4.27	3.87**

Note: *statistically significant at the $p \leq .05$ level; **statistically significant at the $p \leq .01$ level; and ***statistically significant at the $p \leq .001$ level.

There was a statistically significant difference between Executives (M = 4.27, SD = 1.22) and Employees (M = 3.87, SD = 1.38) for the statement "…accepts failure when testing new ideas for products and services," with $t(313) = 2.69$, $p < .01$ suggesting that Employees feel there

is less acceptance of failure when trying new ideas. The remaining three statements did not exhibit a statistically significant difference.

Comparison of perception of organizational processes for open innovation by organization size. A comparison based on organization size in Table 4.21 shows there were statistically significant differences on three of the perception of organization's processes for open innovation statements based on organization size with organizations with < 250 employees having lower mean scores. There was a statistically significant difference between organizations with < 250 *employees (M* = 3.41, *SD* = 1.64) and organizations with ≥ 250 employees *(M* = 3.87, *SD* = 1.44*)* for the statement "…has a formal process for employees to submit their ideas for new or improved products and services (e.g. online submission form, suggestion box, written process) that is clearly communicated to employees," with t(183) = (-2.44), $p<.05$.

There was a statistically significant difference between organizations with < 250 employees (*M* = 3.81, *SD* = 1.52) and organizations with ≥ 250 employees (*M* = 4.35, *SD* = 1.33) for the statement "…provides training to employees to improve their ability to generate and implement ideas," with t(313) = (-2.95), $p<.01$. There was also a statistically significant difference between organizations with < 250 employees (*M* = 3.88, *SD* = 1.46) and organizations with ≤ 250 or employees (*M* = 4.26, *SD* = 1.31) for the statement "recognizes and rewards employees who contribute ideas that are implemented," with t(313) = (-2.16), $p<.05$. These results suggest that smaller organizations have fewer formal processes, less training, and offer less recognition and rewards than do larger organizations.

Table 4.21

Comparison of Means Q11 Executive Respondents and Q16 Employee Respondents: Perception of Organization's Processes for Open Innovation by Organization Size (n=315)

Statements	*< 250 Employees M n=226*	*≥ 250 Employees M n=89*
a. ...has a formal process for employees to submit their ideas for new products and services (online submission form, written process) that is clearly communicated to employees	3.41	3.87*
b. ...has an informal process for employees to share their ideas for new products and services	4.18	4.08
c. ...communicates about and solicits ideas from employees to solve problems within the organization	4.20	4.26
d. ...empowers employees to share their ideas to innovate products and services	4.24	4.25
e. ...provides employees with time to work on ideas outside of their normal job duties	3.69	3.79
f. ...provides training to employees to improve their ability to generate and implement ideas	3.80	4.35**
g. ...provides resources for employees to pursue ideas	3.78	4.06
h. ...provides incentives for employees to share ideas	3.73	3.99
i. ...recognizes and rewards employees who contribute ideas that are implemented	3.88	4.26*
j. ...accepts failure when testing new ideas for products and services	4.11	3.97

Note: *statistically significant at the $p \leq .05$ level; and **statistically significant at the $p \leq .01$ level.

Comparative analysis of organization's receptiveness to open innovation. As shown in Table 4.22, the comparison of the Executive and Employee means for each statement in matrix questions (Q12 and Q17) shows a somewhat higher agreement between the Executive and Employee group for most organization receptiveness statement.

Four of the nine statements in this question exhibited statistically significant differences in an independent-samples t-test. There was a statistically significant difference between Executives (M = 4.52, SD =1.08) and Employees (M = 4.18, SD = 1.38) for the statement "Top management communicates the organization's strategy to employees," with t(280) = 2.27, p<.05. This suggests that Executives strongly believe that they have made clear the organization's strategy while Employees perceive that communication about strategy is less clear.

There was a statistically significant difference between Executives (M = 4.44, SD=1.17) and Employees (M = 3.94, SD=1.43) for the statement "In my experience, once an idea is submitted an employee receives feedback on the idea," with t(281) = 3.31, p=.001. This suggests there is a significant gap in perception with Executives believing that they are providing employees with feedback on ideas while Employees perceive they are receiving feedback with less frequency.

There was a statistically significant difference between Executives (M = 4.32, SD = 1.20) and Employees (M = 3.70, SD = 1.41) for the statement "Employee ideas shared with the organization are often implemented," with t(285) = 4.05, p<.001. This suggests that Executives perceive employee ideas are implemented with greater frequency than perceived by Employees.

There was a statistically significant difference between Executives (M = 3.93, SD = 1.47) and Employees (M = 3.36, SD = 1.63) for the statement "Ownership of an idea (intellectual property rights) is a concern when employees share ideas," with t(289) = 3.12, p<.01. This suggests that Executives are significantly more concerned with intellectual property rights and the ownership of ideas than Employees.

Table 4.22

Comparison of Means Q12 Executive Respondents and Q17 Employee Respondents: Perception of Organization's Receptiveness to Open Innovation (n=295)

Statements	*Executives* *M* *n=148*	*Employees* *M* *n=147*
a. Top management communicates a shared vision for the organization to employees	4.49	4.21
b. Top management communicates the organization's strategy to employees	4.52	4.18*
c. Employees are interested in sharing ideas to improve our products and/or services	4.45	4.30
d. Employees have good quality ideas to share	4.62	4.53
e. Employees have sufficient knowledge of the market and competitors to provide relevant ideas	4.40	4.48
f. Employees have sufficient knowledge of customers and customer needs to provide relevant ideas	4.59	4.76
g. In my experience, once an idea is submitted an employee receives feedback on the idea	4.44	3.94***
h. Employee ideas shared with the organization are often implemented	4.32	3.70***
i. Ownership of an idea (intellectual property rights) is a concern when employees share ideas	3.93	3.36**

Note: *statistically significant at the $p \leq .05$ level; **statistically significant at the $p \leq .01$ level; and ***statistically significant at the $p \leq .001$ level. Twenty respondents completed Q11 and Q12 but did not complete the second set of perception questions Q12 and Q17 leading to two different n's.

Comparison of perception of organization's receptiveness to open innovation by organization size. A comparison of means in Table 4.23 shows one statistically significant difference by organization size for the "employees have sufficient knowledge of the market and competitors to provide relevant ideas" statement. Organization with < 250 employees (M = 4.35, SD = 1.21) and ≥ 250 employees (M = 4.65, SD = 4.35) were statistically significantly different

with t(213) = (-2.33), $p<.05$. This result suggests that organizations with < 250 employees are less likely to agree that employees have sufficient knowledge of the market and competitors to provide relevant ideas.

Table 4.23

Comparison of Means Q12 Executive Respondents and Q17 Employee Respondents: Perception of Organization's Receptiveness to Open Innovation by Organization Size (n=295)

Statements	*< 250 Employees* *M* *n=208-209*	*≥ 250 Employees* *M* *n=85-86*
a. Top management communicates a shared vision for the organization to employees	4.33	4.41
b. Top management communicates the organization's strategy to employees	4.35	4.36
c. Employees are interested in sharing ideas to improve our products and/or services	4.30	4.57
d. Employees have good quality ideas to share	4.52	4.71
e. Employees have sufficient knowledge of the market and competitors to provide relevant ideas	4.35	4.65*
f. Employees have sufficient knowledge of customers and customer needs to provide relevant ideas	4.61	4.83
g. In my experience, once an idea is submitted an employee receives feedback on the idea	4.16	4.23
h. Employee ideas shared with the organization are often implemented	3.94	4.19
i. Ownership of an idea (intellectual property rights) is a concern when employees share ideas	3.60	3.74

Note: *statistically significant at the $p\leq.05$ level.

Comparative analysis of new product development, existence of internal research and development staff, and open innovation by organization size. Comparative analyses, as shown in Table 4.24, were conducted to understand if organization size had an impact on the

existence of new or improved product and service development and on open innovation activities. Executive participants were asked if their organization had≤ created any new or improved products or services in the last few years. A Chi-Square analysis by organization size showed no significant differences in whether the respondent's organization was recently engaged in developing new and improved products and services.

All participants were asked if their organization had internal staff who did research and development or new product development as part of their work assignment. There was a significant difference in yes or no responses based on organization size with 56.8% of organizations with < 250 employees and 78.0% of organizations with ≥ 250 employee having internal research and development or new product development staff. A Chi-Square test for independence was conducted comparing responses to the internal research and development question based on organization size, with the results showing $\chi^2(2) = 13.97$, $p = .001$. This result suggests that larger organizations are more likely to have internal research and development staff than smaller organizations.

Table 4.24

*Comparison of Internal Research and Development Staff by Organization Size (n=277)**

Internal Research and Development Staff	*<250 Employees Percent*	*≥ 250 Employees Percent*
Yes	66.3%	87.7%
No	33.7%	12.3%
Total	100.0%	100.0%

Note: *Chi-square statistically significant at the $p \leq .001$ level. Percentages exclude Don't Know/Not Sure answers.

Unlike respondent role, organization size did affect a survey participant's perception of their organization's involvement in open innovation. An independent samples t-test was conducted to identify if organization size had an impact on respondent perception of frequency of engagement in open innovation activities. There was a statistically significant difference based on organization size between organizations with < 250 employees (M = 2.93, SD = 1.08) and those with ≥ 250 or more employees (M = 3.26, SD = 1.07) in perceived frequency of open innovation activities, with t(281) = (-2.32), p<.05. These results suggest that respondents from organizations with ≥ 250 employees perceived that their organizations engaged in open innovation activities more frequently than organizations with < 250 employees.

Executive respondents who indicated their organization engaged in open innovation activities were asked whether those activities were conducted as a formal or informal component of the organization's business model. A Chi-Square test found no significant difference in open innovation being a formal or informal part of the business model based on organization size.

Summary

A total of 320 survey responses–163 Executives and 157 Employees–were utilized for data analysis in this study. The respondents for the study consisted primarily (97.5%) of workers on Amazon's® Mechanical Turk® platform. Means, standard deviation, percentage distribution, independent samples t-tests, and Chi-Square analyses were completed for the data where appropriate.

Executives (M = 2.96) and Employees (M = 3.09) indicated that their organizations were engaged with open innovation activities with 97.6% of Executives indicating open innovation was either a formal or informal part of their business model. Executives identified the most frequent source of ideas for new products and services for their organization as

entrepreneur/owner (*M* = 3.59), employees (*M* = 3.55), executives (*M* = 3.49), and customers (*M* = 3.43). Executives also responded that the reason they engage in open innovation is primarily to identify new business opportunities (*M* = 4.62), to solve problems (*M* = 4.60), and to increase efficiency (*M* = 4.59). Approximately half (51.7%) of Employees had shared ideas for new and improved products and services or improved processes with their organization.

The study also compared Executive and Employee perceptions of their organization's processes for and receptiveness to open innovation and idea sharing. Executives and Employees had differing perspectives on both perception of organization's processes for open innovation and perception of organization's receptiveness to open innovation. Executive mean scores on statements in the perception of organization's processes for open innovation question ranged from 3.76 to 4.41 while Employee mean scores ranged from 3.31 to 4.10. An independent samples t-test on perception of organization's processes for open innovation found significant differences between Executives and Employees on seven of ten statements. Executive mean scores on the perception of organization's receptiveness to open innovation question ranged from 3.93 to 4.62 while Employee mean scores ranged from 3.36 to 4.76. An independent samples t-test on perception of organization's receptiveness to open innovation found significant differences between Executives and Employees on four of nine statements.

A discussion of the results, implications of the results, limitations of the study, and future directions for research will be presented in Chapter V.

Chapter V: Discussion

Despite a large body of literature addressing innovation, in particular leadership and organizational factors fostering innovation, there are still many gaps in our understanding of how innovation happens within organizations and how open innovation occurs in small- and medium-sized enterprises (SMEs). This study sought to determine whether SMEs are actively engaging in open innovation as well as the conditions under which these open innovation activities occur. The study also sought to explore the perception of Executives and Employees regarding organizational, management, and employee beliefs and behaviors related to open innovation and employee idea sharing.

The study explored the following three main research questions and two sub-questions:

(1) To what extent do executives and employees in SMEs perceive that their organization engages in open innovation? Where do ideas for new or improved products and services originate in SMEs?

(2) How do executives and employees perceive their organization's receptiveness to employee ideas for new or improved products or services and what barriers does each group perceive to sharing or implementing those ideas?

(3) How do executives and employees differ in their perception of the organization's receptiveness to employee ideas and the barriers that exist to sharing and implementing employee ideas as part of the open innovation process? How does organization size affect open innovation activities and perception of innovation processes and activities?

This chapter provides a summary of results, interpretation of results, implications for practice, limitations and strengths of the study, and recommendations for further study.

Summary of Results

The study was conducted via a survey of 320 individuals currently working in small and medium sized (SMEs) for-profit organizations of which 163 were Executives (owner, partner, executive, or manager) and 157 were Employees (supervisor or project/team lead, non-managerial employee, or other). Eighty-five percent (85%) of respondents indicated that they had direct contact with customers. More Executive respondents reported that they had direct contact with customers (90.8%) than Employee respondents (79.0%). For the 280 respondents who answered these two demographic questions, gender was approximately half male (50.4%) and half female (48.2%); this even split was the same for both the Executive and Employee roles. Responses for the question regarding employment status indicated that 83.9% of respondents were working full-time in their organization with 16.1% working part-time.

The respondents' organizations were SMEs, with 71.7% having 1–249 employees, 14.1% having 250–499 employees, and 14.4% having 500+ employees. The definition of what constitutes an SME varies depending upon who is setting the definition. For the purposes of this dissertation, analyses including organization size were conducted based on two size categories 1 to 249 employees (< 250) and equal to or greater than 250 employees (≥ 250). Selected comparative analyses were split into these two categories so that results could be more easily compared to prior research—much of which is based on European organizations—which utilizes the Organization for Economic Co-operation and Development (OECD) parameters for organization size. OECD (2018) defines SMEs as having fewer than 250 employees. The inclusion of organizations with ≥ 250 employees in the analyses reflects the focus of the study on U.S. organizations and the broader U.S. Small Business Administration definition of a small

business which, depending upon industry, can include organizations with up to 1,500 employees (USSBA, n.d.).

The results of this study found that respondents reported almost all of their organizations (97.6%) were either formally or informally engaging in inbound open innovation activities as part of their business model. Based on the mean scores, on a scale of 1 (*strongly disagree*) to 6 (*strongly agree*), the owner of the organization (M = 3.59), employees (M = 3.55), executives (M=3.49), and customers (M=3.43) were almost equally important sources of ideas. The study also found significant differences in perception between Executives and Employees on ten of 19 statements focused on organizational processes related to idea sharing as well as the organization's receptiveness to open innovation. Executives consistently agreed with statements more strongly than Employees.

The communication of the organization's strategy is particularly important in open innovation as it is so closely tied to the organization's strategy. Employees who do not know in which direction the organization wants to go cannot share relevant ideas that will further the organization's goals. Communication of a shared vision is also an important factor. Executives perceived more strongly that they were communicating their open innovation vision and strategy to employees than did Employees.

The largest difference in perception between Executives (M = 4.22) and Employees (M = 3.39) was around the issue of whether the organization provided incentives for sharing ideas. There was also a statistically significant difference between Executives and Employees regarding whether the organization recognizes and rewards employees who contribute ideas that are implemented, with Executives perceiving a higher presence of recognition and rewards than

Employees. These results suggest that Executives are perceiving that they are incentivizing and rewarding employee idea sharing while Employees do not as readily believe that is the case.

There were statistically significant differences on organization size for four of the 19 perception of open innovation processes statements. Three of the statements addressed if the organization: had a formal process for idea sharing, provided training for employees on idea generation and implementation, and recognized and rewarded employees for their ideas that are implemented. For these three statements, Executives were more likely to agree that their organization engaged in those activities than the Employees. The fourth statement was whether employees had sufficient knowledge of the market and competitors to provide relevant ideas. Employees more frequently agreed that they had sufficient knowledge than Executives gave them credit for.

Executives and Employees both *somewhat agreed* that their organization empowered employees to share ideas and actively solicits ideas from employees. The study also found that employees not only wanted to share ideas but that they were actively engaged in doing so. Of the Employee respondents, 51.7% had shared an idea with their organization while 60.8% had either shared an idea and/or knew of a fellow employee who did.

Interpretations of Results/Conclusions

There is widespread agreement that innovation is vital if businesses want to remain competitive in today's rapidly changing global marketplace (e.g. Bhat, 2010; Musteen et al., 2010; Shipton et al., 2005). Organizational innovation is dependent upon both organizational systems and individual efforts. Research into organizational and individual factors supporting or acting as barriers to innovation has included: organizational innovation processes (Desouza et al., 2009); organizational mechanisms supporting innovation (Bharadwaj & Menon, 2000);

organizational culture (Dombrowski et al., 2007); the role of leaders (Mumford et al., 2002; Paulsen et al., 2009; Shipton et al., 2005; Stenmark et al., 2011); the effect of leadership or management on organizational or employee innovation capability (Charbonnier-Voirin et al., 2010; Gilley et al., 2008; Horng et al., 2011; Krause, 2004; Lee & Kelley, 2008; Michaelis et al., 2009; Michaelis et al., 2010; Musteen et al., 2010; Paulsen et al., 2009; Wang & Casimir, 2007); and characteristics of the individual (Hammond, et al., 2011).

Increasingly, organizations including SMEs, are utilizing open innovation activities as a way to improve their product and service development. Henry Chesbrough (2003) coined the term "open innovation" to refer to the practice of firms relying on both internal and external sources for developing new products. Open innovation is defined as "the use of purposive inflows and outflows of knowledge to accelerate internal innovation and to expand the markets for external use of innovation, respectively" (Chesbrough et al. 2006, p. 1). The majority of open innovation research to date has focused on large and multinational organizations with open innovation practices in SMEs largely unexplored (Brunswicker & van de Vrande, 2014; van de Vrande et al., 2009). While it is clear that SMEs do engage in open innovation, how open innovation takes place in SMEs and how SME open innovation differs from large organizations remains unclear (Brunswicker & van de Vrande, 2014) and has not been extensively researched.

Much of the extant open innovation research has not explicitly addressed the role in or participation of non-research and development employees as part of the open innovation process. The focus has been primarily on examining the role of external partners, such as suppliers or universities. However, some researchers (e.g. Chesbrough & Brunswicker, 2013; Santoro et al., 2016; van de Vrande et al., 2009) treat non-R&D employees as idea sources "outside" of the

organization and view these internal innovation sources as partners in inbound open innovation in their research.

This study specifically sought to expand on the available knowledge of open innovation activities in SMEs and to extend the context of open innovation to including the role of non-research and development employees in the innovation process as well as the organization's receptiveness to employee ideas for new and improved products and services. Therefore, for the purpose of this study, the definition of inbound open innovation provided to participants in the survey was: *an organization utilizing resources other than a formal internal research and development process to generate ideas for new or improved products and services*. Examples of those external resources provided to participants included: customers, suppliers, crowdsourcing (e.g. social media posts), universities, and government entities, as well as employees who are not typically involved in research and new product and service development.

New product development in SMEs. Executives reported that new product and service development and/or the selling of improved products or services were occurring or had occurred in the last few years in a little over half of the organizations (51.5%). This also indicates that about half of the organizations had not developed any new or improved products or services in the recent past. This result follows Spithoven et al. (2013) who found that SMEs (47.3%) launch fewer innovative products and services than large firms (61.7%). This study found no significant difference between the number of respondents reporting new or improved products or services between organizations with < 250 employees and those with ≥ 250 employees; however, all of these organizations are still considered SMEs when compared to large firms. The range of new and improved products and services being developed by study respondents was broad including: software applications, cosmetics, arts education, medical devices, and consulting services.

SMEs are typically described as being challenged to develop new innovations or products and services due to their small size and lack of resources (e.g. Brunswicker & Vanhaverbeke, 2015; Gassmann et al., 2010; Wynarczyk, Piperopoulos, & McAdam, 2013) including a lack of internal research and development staff or staff devoted to creating new products. This study, however, found that 62.8% of SMEs had personnel formally assigned responsibility for research and development or new and/or improved product and service development. However, participants were not asked to elaborate on the nature of new product and service development activities in the organization; therefore, it is not clear what level of staff and resources the organization was devoted to research and development of new products and services.

In support of Vanhaverbeke's (2017) observation that large enterprises typically have sizable internal research and development staff, this study found a significant difference related to organization size and the presence of internal research and development staff. Slightly more than half (56.8%) of respondents in organizations with < 250 employees and 78.0% in organizations with ≥ 250 employees reported having internal research and development staff. This result suggests that larger organizations are more likely to have internal research and development staff than smaller organizations. On the other hand, it also suggests that SMEs participating in open innovation activities are not using those activities to replace internal research and development. This finding corroborates the findings of Chesbrough and Crowther (2006) in their study of large organizations and Laursen and Salter's (2006) study of United Kingdom manufacturing firms.

Engagement in open innovation and business model. Approximately 70% of Executive and Employee respondents indicated that their organizations sometimes (~40%), fairly often (~20%), or very often (~10%) engaged in open innovation activities while approximately

30% indicated that their organization rarely (~21%) or never (~9.0%) engaged in open innovation activities. There was no significant difference in the frequency with which Executives and Employees perceived that their organizations were engaging in open innovation activities. The extant literature indicates that SMEs do engage in open innovation to their benefit (Brunswicker & van de Vrande, 2014); however, Gassmann et al. (2010) discussed that the limited available research suggests that while SMEs engage in open innovation, they do so at an unspecified much lower rate than large organizations.

In support of Gassmann et al. (2010), there was a statistically significant difference in perceived open innovation engagement based on organization size. This study found that organizations with ≥ 250 employees engaged in open innovation activities more frequently than organizations with < 250 employees. These results are also mirrored by Theyel's (2012) study which found that 50% of U.S. SMEs engage in open innovation and van de Vrande et al. (2009) which found that Dutch SMEs are extensively practicing open innovation activities and that larger SMEs (100–499 employees) are more likely to engage in open innovation.

Executives in this study indicated that virtually all (97.6%) of their organizations were utilizing open innovation when developing new or improved products or services. In addition, Executives indicated that open innovation was a formal (59.5%) or informal (38.1%) part of their organization's business model; this implies that the SMEs in this study were utilizing open innovation as a core part of the organization's strategy. This result follows the extant literature which emphasizes a necessary connection between innovation and/or open innovation and an organization's business model, and its strategy (Brunswicker & van de Vrande, 2014; Chesbrough, 2003a; Oster, 2009; Vanhaverbeke & Cloodt, 2014). There was no significant

difference in open innovation being a formal or informal part of the business model based on organization size.

Motivation for engaging in open innovation activities. Executives whose organizations were engaged in open innovation were asked the motivation for those activities. The range of mean scores (M = 4.30 to 4.62) indicated that all the offered statements represented relatively important motivations for engaging in open innovation. The top responses with the highest mean scores as well as the highest percent of *agree* and *strongly agree* responses were: to identify new business opportunities (63.5%), to solve problems (58.9%), to increase efficiency (58.4%), and to keep up with competition (59.2%).

The two least likely reasons why organizations chose to engage in open innovation based on *agree* and *strongly agree* responses were: to involve non-research and development employees in product development and improvement (47.6%) and to reduce the cost of new product or service development (46.1%). Therefore, while non-research and development employees are important sources of ideas for product development and improvement, getting their involvement was not seen as a primary reason for organizations to engage in open innovation activities. The results of this study corroborate the findings of extant research such as van de Vrande et al. (2009), who in their survey of Dutch SMEs, found that the motives for engaging in open innovation practices were market-related such as keeping up with market developments and meeting customer demand. Motives related to costs and efficiency were less important reasons for large organizations (Chesbrough & Crowther, 2006) or SMEs to engage in open innovation activities (van de Vrande et al., 2009) as they were for organizations in this study.

Source of ideas. Respondents were asked to identify the sources of ideas for new and improved products and services in their organization. Based on the mean scores, on a scale of 1 (*strongly disagree*) to 6 (*strongly agree*), the owner of the organization (M = 3.59), employees (M = 3.55), executives (M = 3.49), and customers (M = 3.43) were identified as almost equally important sources of ideas. This matches with the research of Hutter et al. (2013) who found that the owner was the main source of ideas for new products, but that internal employees were also considered an important idea source. Chesbrough and Brunswicker (2013), in their study of large organizations, found that internal employees were considered the most important partner in open innovation followed directly by customers.

Executive versus employee perception of organization's processes for and receptiveness to open innovation. The study asked participants to respond as to whether they disagreed or agreed with two series of statements. The statements focused on their perception of their organization's: processes for open innovation and receptiveness to open innovation for the development of new and improved products and services. Executives and Employees were given statements with response options of: (1) *strongly disagree*, (2) *disagree*, (3) *somewhat disagree*, (4) *somewhat agree*, (5) *agree*, and (6) *strongly agree*. Executive responses to the process and activities statements had mean scores in the *somewhat agree* to *agree* (M = 3.76 to 4.62) range. Employees, however, had a broader range of mean scores from 3.31 to 4.76.

Executives and Employees had differing perspectives on both perception of organization's processes for open innovation and perception of organization's receptiveness to open innovation. Executive mean scores on statements in the perception of organization's processes for open innovation question ranged from 3.76 to 4.41 while Employee mean scores ranged from 3.31 to 4.10. An independent samples t-test on perception of organization's

processes for open innovation found significant differences between Executives and Employees on seven of ten statements. Executive mean scores on the perception of organization's receptiveness to open innovation question ranged from 3.93 to 4.62 while Employee mean scores ranged from 3.36 to 4.76. An independent samples t-test on perception of organization's receptiveness to open innovation found significant differences between Executives and Employees on four of nine statements.

According to Chesbrough and Brunswicker (2013), successful adoption of open innovation across an organization requires moving open innovation from an *ad hoc*, informal process to a formal system with a clearly documented strategy for open innovation, written and standardized processes, and metrics for measuring the impact of open innovation activities. Executives perceive their organization's processes and receptiveness to open innovation differently than Employees. This disconnect between Executives and Employees indicates that Executives are perceiving that their organizational processes, culture, and personnel are engaging in behaviors or activities that foster employee idea sharing and, thusly, open innovation. However, Employees are less likely to agree that their organization both has processes in place and is receptive to open innovation.

Employee knowledge. There were two statements where the Employee mean score was higher than the Executive mean; however, the differences were not statistically significant. These statements addressed the perception of whether employees have the knowledge necessary to provide ideas that are relevant to the organization. A significant difference based on organization size, however, was present for the statement "employees have sufficient knowledge of the market and competitors to provide relevant ideas." Respondents from organizations with

≥250 perceived that employees were more likely to have sufficient knowledge of the market and competitors than did respondents from organizations with < 250 employees.

Closed innovation systems exclude non-research and development employees—such as frontline employees who have direct contact with customers—from the innovation process. This can have a significant impact on an organization's ability to generate value for customers because it is the frontline employees who are in the best position to understand customers, identify customer needs and wants, and obtain information from customers as to how products and services can be innovated to better satisfy customers. Other employees, such as shop floor employees involved in manufacturing, are also important contributors in the innovation process as they have a unique perspective on and knowledge about the organization's operations (Axtell et al., 2006).

Therefore, capturing the ideas and knowledge of these non-research and development employees is important for organizational innovation efforts (Selden & MacMillan, 2006). However, van de Vrande et al. (2009) found that, while employees were considered an important source of ideas, Dutch SMEs also identified a lack of employee knowledge as one of the barriers to adopting open innovation practices.

Organizational process for collecting employee ideas. Executives (M = 3.76) and Employees (M = 3.31) differed significantly in their perceptions of whether their organization had a formal process for idea submission that was clearly communicated to employees. Both groups *somewhat agreed* that there was an informal process for employees to share their ideas for new products and services. There were also several narrative comments discussing the informal nature of the process and that ideas were shared across the organization on an informal basis. There was a significant difference related to organization size and the perception of a

formal process for idea sharing. Respondents from organizations with ≥ 250 employees (*M* = 3.87) were more likely than study participants from organizations with < 250 employees (*M* = 3.41) to recognize the existence of a formal process. The lack of a formal process can be a significant barrier to employee idea sharing as illustrated by this employee quote: *A lot of times I'll have an idea on how to make something we do more efficient but I hesitate to share it because there simply is no simple process or incentive.*

This result regarding the formal and informal nature of employee idea sharing processes ties with extant research that shows organizations, including SMEs, typically do not have formal internal organizational practices or structure in place to manage open innovation and for capturing and implementing ideas (Gassmann et al., 2010). Chesbrough and Brunswicker (2013) found that, even in large organizations with revenue in excess of $250 million, there has been a low-level of adoption of formal and informal organizational practices for managing open innovation.

Internal managerial innovation practices are key for open innovation success in SMEs (Brunswicker & Vanhaverbeke, 2015). Engaging in open innovation requires SMEs to develop new capacities for organizational knowledge and innovation management (Brunswicker & van de Vrande, 2014). In addition, organizational innovation processes (Desouza et al., 2009); organizational mechanisms supporting innovation (Bharadwaj & Menon, 2000); and organizational culture (Dombrowski et al., 2007) are all important determinants of individual-level creativity and thusly employee idea sharing.

There was a significant difference in the perception of Executives (*M* = 4.44) and Employees (*M* = 3.94) regarding whether, in their experience, once an idea is submitted an employee receives feedback on the idea. Executives were more likely than Employees to agree

that feedback is given. The lack of feedback is also a barrier that can prevent employees from future idea sharing. Without feedback, employees may assume that their idea was ignored, was considered a poor idea, or that someone else has taken credit for their idea, particularly if they see it implemented within the organization without the employee receiving any recognition. Amabile et al. (1996) identified fair and supportive feedback as an important component for organization encouragement and development of new ideas.

Communication. Executives and Employees somewhat agreed that top management was communicating a shared vision for the organization to employees and also that top management communicated the organization's strategy to employees. However, there was a significant difference in the perception of Executives ($M = 4.52$) and Employees ($M = 4.18$) regarding communication of the organization's overall strategy to employees. Again, Executives were more likely than Employees to perceive that the communication was happening. This is particularly important in open innovation as it is so closely tied to the organization's strategy. Employees who do not know which opportunities their organization wants to pursue cannot share relevant ideas that will further the organization's goals.

Tan (1998) sees open communication as important for innovation as creativity depends on the exchange of ideas within the organization. Open communication includes sharing a clear vision for the organization and the direction in which its innovation efforts are headed. A vision or shared vision is frequently cited as a determinant of innovation (e.g., Gumusluoğlu & Ilsev, 2009b; Ng, 2004; Oke et al., 2009).

In addition to communication, top management support for open innovation practices and providing direction and alignment with organizational objectives was identified by Chesbrough and Crowther (2006) as a key success factor for inbound open innovation. This study found

that Executives consistently perceived they were communicating more effectively regarding processes, vision, and strategy than did Employees. All four statements that referenced communication had Executives rating their communication more highly than Employees with three of the four statements having statistically significant differences.

This difference in the communication finding between Executives and Employees ties with the findings of Lahi and Elenurm (2014) who identified the innovation leader, manager, or entrepreneur as the most critical factor for open innovation success. The leaders and managers in the organization must communicate the priorities, processes, and support for open innovation effectively to employees for employees to fully engage in the process.

Rewards and incentives. The largest disconnect between the perception of Executives and Employees was regarding whether their organization provides incentives for employees to share ideas, with Executives *somewhat agreeing* ($M = 4.22$) and Employees *somewhat disagreeing* ($M = 3.39$). There was also a significant difference between Executive ($M = 4.22$) and Employee ($M = 3.75$) perception of whether their organization recognizes and rewards employees who contribute ideas that are implemented. These results suggest that Executives perceive their organizations to be providing incentives and recognition both for idea sharing and implementation while Employees are more likely to perceive a lack of incentives and rewards.

Respondents from organizations with < 250 employees ($M = 3.88$) were significantly less likely to agree that their organization "…recognizes and rewards employees who contribute ideas that are implemented" than participants from organizations with ≥ 250 employees ($M = 4.26$). Larger organizations are perceived to provide more recognition and rewards than smaller organizations. Executives were also significantly more likely to *somewhat agreed* ($M = 4.27$) than Employees who *somewhat disagreed* ($M = 3.87$) that their organization accepts failure when

testing new ideas for products and services. To foster innovation, organizations must create an environment that welcomes appropriate risk (Amabile et al. 1996; Oster, 2009).

Executives and Employees were both asked to comment narratively regarding any other perceptions they had of their organization with respect to incentives and recognition. Lack of incentives or recognition for idea sharing was one of the narrative themes identified for both Executives and Employees. An example of comments from each group:

- Executive: "When ideas are shared and implemented, many times there is no recognition or even payment for bringing in extra business. Bonuses are also non-existent."
- Employee: "There is a tendency to pretend an idea is bad, sit on it, and then implement it without giving the person who came up with it any credit."

Gassmann et al. (2010) point out that open innovation requires a culture that values outside knowledge and that culture is influenced by several factors including an organization's incentive systems.

Resources for employees. There was no significant difference in Executive and Employee perception of whether their organization provides training to employees to improve their ability to generate and implement ideas. Both respondent groups gave average responses in the range of *somewhat disagree* to *somewhat agree*. However, there were significant differences based on organization size. Respondents from organizations with ≥ 250 employees ($M = 4.35$) were more likely to agree that the organization provides training than participants from organizations with < 250 employees ($M = 3.81$). These results suggest that, while there is no difference in perception of what training is provided based on role in the organization, smaller organizations are perceived to provide less training than larger organizations.

There were significant differences in perception between Executives and Employees regarding whether the organization provides resources for employees to pursue ideas (M = 4.06 and M = 3.66, respectively) and whether their organization provides time for employees to work on ideas outside their normal job duties (M = 3.96 and M = 3.66, respectively). These results suggest that Executives are somewhat more likely to believe they are providing sufficient resources to employees to foster ideation and implementation while Employees are perceiving less resource support for working on and pursuing ideas.

Ideation is based in employee creativity; therefore, to enhance innovation, resource allocation needs to address both developing employee's individual creativity, which forms the basis for organizational innovation (Amabile, 1988) and organizational mechanisms for encouraging and facilitating individual creativity (Bharadwaj & Menon, 2000). Organizations signal the importance of innovation and expectations for employees by allocating funds (Kanter, 1988) and supporting the development of employees' creativity-relevant skills through training and education (Amabile 1988). Van de Vrande et al. (2009) identified several organizational barriers to successful open innovation including balancing innovation and daily tasks while Hutter et al. (2013) found lack of time to be a significant barrier to successful innovation.

Intellectual property. Executives and Employees both *somewhat disagreed* that intellectual property rights were a concern when employees were sharing ideas. There was a statistically significant difference between Executives (M = 3.93) and Employees (M = 3.36) with Executives perceiving intellectual property as more of a concern than did Employees. Intellectual property is an ongoing issue for many SMEs as many do not have a process or systematic approach for handling intellectual property in place (Spithoven et al., 2013) and often

favor informal intellectual property protection mechanisms (Brunswicker & van de Vrande, 2014).

Employee idea sharing. The study results suggest that employee ideas do have value to organizations based on organizations actively soliciting ideas from employees, implementing employee ideas, and identifying employees as the greatest source of ideas for new and improved products and services for the organization just behind the owner. Executives and Employees both *somewhat agreed* that their organization empowers employees to share their ideas to innovate products and services.

While employees are an important source of ideas, there were statistically significant differences in how Executives and Employees perceived whether the organization communicates and solicits employee ideas to solve organizational problems and whether employee ideas are often implemented.

There was a statistically significant difference between Executives (M = 4.41) and Employees (M = 4.02) regarding whether their organization communicates about and solicits ideas from employees to solve problems within the organization. These internal innovations are referred to as process innovations or innovations that address issues internal to the organization rather than customer-focused innovations. There was also a statistically significant difference between Executive (M = 4.32) and Employee (M = 3.70) perception of whether employee ideas shared with the organization are often implemented. Executives appeared to perceive that employees were encouraged to share ideas and had their ideas implemented and accepted more frequently than Employees.

Executives and Employees agreed that employees are interested in sharing ideas to improve their organization's products and/or services and both groups indicated that employee

ideas are implemented within their organization. Of the Employee respondents, 51.7% had shared an idea with their organization and 37.3% were aware of a time when a fellow employee had shared an idea. When looked at as an either/or situation 60.8% of employees either had shared an idea and/or knew a fellow employee who had shared an idea. There was no significant difference on perceived frequency of idea sharing based on organization size.

There were three main themes identified from the Employee narrative responses regarding their personal experience in sharing ideas with and their knowledge of fellow employee idea sharing within their organization. These three conflicting themes were: the idea was implemented, their idea was not welcome, and the idea was received by an upper level of management but went nowhere. Narrative quotes from Employees illustrate these themes:

- Idea was implemented: "I first shared my idea with members of my team. They provided guidance and helped me work out details. After I felt confident in what I had developed, I brought the idea to my direct supervisor. He altered minor details, but my organization ended up implementing the idea."
- Idea was not welcome: "I brought up an idea during a meeting. I was told it wasn't my area of expertise. I was angry for quite a while afterwards. Then a few months later we get a memo saying that they were making the change I suggested. Of course, my name was nowhere on that memo. It hasn't happened just to me either."
- Idea received by upper level management but went nowhere: "There is no official process but ideas are shared during team meetings. Good ideas will be pushed up the food chain. It's rare that we ever hear about it after that, although it is possible that the idea will be worked on and implemented."

Executives were not asked to discuss their personal idea sharing experiences but an Executive's comment regarding idea sharing in their organization illustrates the perception that ideas are not always welcome: *My company does not encourage this and certainly does not incentivize it.*

One Executive comment was of particular interest because it reflects a perception that employees are failing to share ideas, but that employees are actually actively withholding valuable ideas away from the organization: *I believe there are more ideas out there but most of the employees keep the ideas to themselves to be able to start working for themselves instead of using them to help build up the company.*

The narrative responses frequently discussed employee ideas being implemented; however, many of the ideas described as implemented were process innovations rather than new and/or improved products and services. Therefore, it is unclear if Executives and Employee responses reflect the implementation of process innovations only, the development of new and improved products and services, or a combination of both.

The study identified five categories of internal barriers to open innovation and employee idea sharing within organizations which are summarized in Figure 5.1. The five categories identified were leadership and management, structure and processes, culture, resources, incentives and rewards. Both Executives and Employees identified issues with activities in all these categories. For example, both Executives and Employees identified a lack of a formal process and a lack of incentives for idea sharing as an issue within their organization.

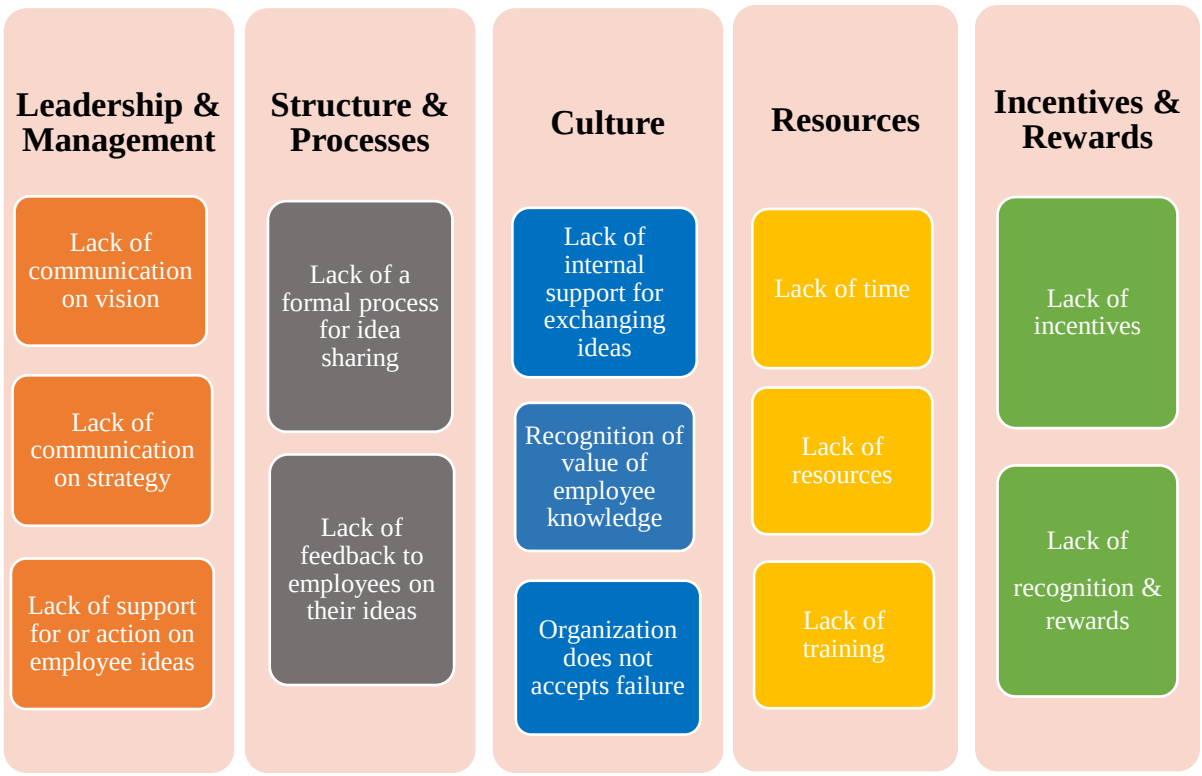

Figure 5.1 Internal Barriers to Open Innovation

Implications for Leadership Practice

Leaders facilitate employee creativity through activities or behaviors such as psychological empowerment (Gumusluoğlu & Ilsev, 2009b), participative management (Wang & Casimir, 2007), and by providing support to help employees share ideas (Damanpour & Schneider, 2006). Individual leader attributes such as their ability to establish a culture or climate that fosters innovation (Damanpour & Schneider, 2006; Gilley et al., 2008) or a lack of knowledge (Horng et al., 2011) may be facilitators of, or barriers to, organizational innovation.

This study suggests that U.S. SMEs are engaging in open innovation activities including collecting ideas from non-research and development employees; however, Executives and Employees have differing perceptions of their organization's processes and top management's receptiveness to employee ideas. There appears to be a disconnect between what Executives believe they are doing and what Employees are perceiving to be happening. This study provides

some insight into some of the barriers both perceptual and organizational that may be preventing organizations from fully realizing the benefits of their open innovation activities. Employees – including those not typically involved in research and development – are an important source of ideas for the organization.

Utilizing open innovation may help SMEs reduce some of the disadvantages SMEs have in new and improved product and service development due to their small size and typical lack of resources compared to large organizations. However, open innovation requires leaders to have specific skills and competencies and to create an organizational culture that values ideas from throughout the organization as well as from outside the organization. In addition, open innovation requires the appropriate business model, strategy, and structure for an organization to benefit from its open innovation activities. Research on open innovation in SMEs has not progressed to the point where there is a perfect path supported by empirical research.

Leader's influence on the organizational culture and values, have been discussed both as contributing to or hindering innovation (Yukl & Lepsinger, 2006). Leaders shape an organizations' potential to generate innovations by fostering a culture of innovation that facilitates knowledge generation and implementation (Aragón-Correa et al., 2007). Research has shown that the leadership style of individual leaders and how effectively they support and encourage employees to achieve organizational goals (Lee & Chang, 2006) and their ability to implement change and drive innovation (Gilley et al., 2008), is crucial to successful innovation.

Research has identified leadership behaviors that facilitate organizational innovation including: helping to create an environment for creativity (Wang & Casimir, 2007); communicating to employees the vision and purpose of the organization (Charbonnier-Voirin et al., 2010; Sarros et al., 2011); team building (Aragón-Correa et al., 2007); and accepting risk and

the possibility of failure (Northouse, 2007). These behaviors also support open innovation activities.

Recommendations for Practice

There are many models of how an organization can be structured to promote innovation; however, there is no one size fits all model that can be used by every organization. What works for a large organization is rarely appropriate for an SME. This is particularly true in the area of open innovation in SMEs as most open innovation research to date has focused on large organizations. This study, however, provides some insight into how SME organizations and leaders can improve their organization's engagement in open innovation and encourage one of their most important sources of ideas for new and improved products, services, and processes—employees.

The results of this study indicate that there is a clear disconnect between what Executive and Employee respondents perceive their organizations are communicating and doing to encourage open innovation and employee idea sharing. Organization leaders need to look closely at their processes and culture and make sure what they believe they are communicating and incentivizing is what employees are actually perceiving.

Figure 5.2 outlines a framework for what must be aligned in organization's that wish to capitalize on their open innovation efforts.

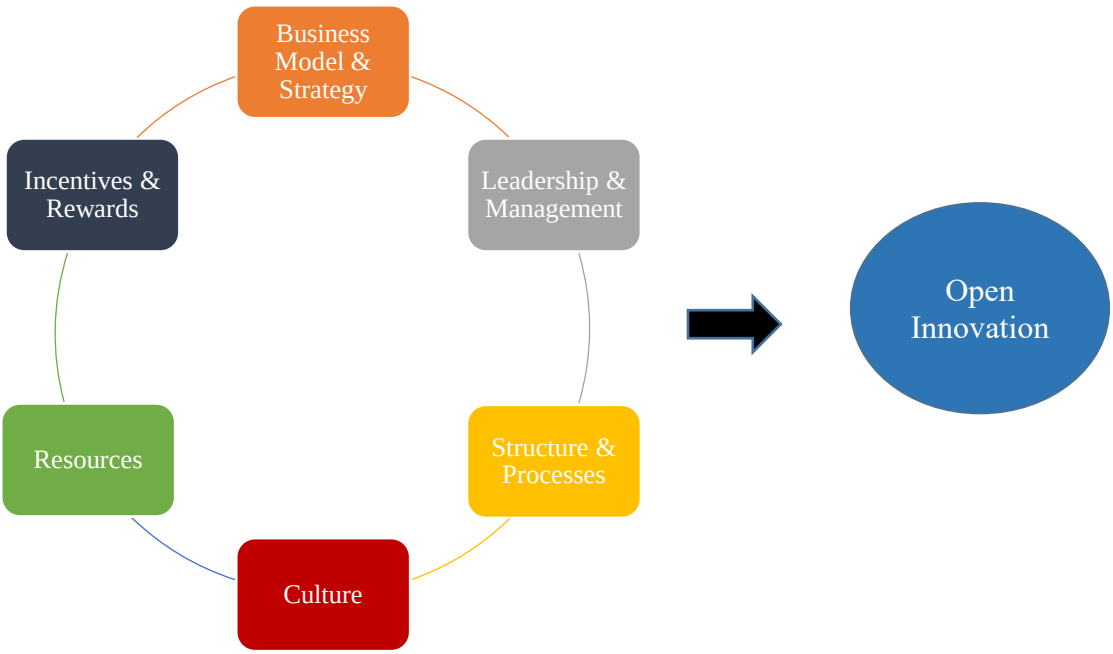

Figure 5.2 Framework for Open Innovation

Successful open innovation begins with a commitment to integrate open innovation as part of the organization's business model and thusly its strategy as well. Organizations that want to engage in open innovation in meaningful ways cannot do so on an ad hoc basis as open innovation requires embedded processes within the organization's structure and operations to capture and implement ideas both from outside the organization and internally from employees outside the normal research and development process.

Leaders facilitate open innovation by walking their talk. It is not enough to say that open innovation and employee idea sharing are welcome or encouraged, but the leader must also act to encourage and reward employee idea sharing behavior. Support from managers and supervisors within the organization is vital as they have the most direct contact with employees. A manager or supervisor who is unwilling to hear ideas or who takes credit for employee ideas will impede employee idea sharing even if there is a formal process and incentives for idea sharing in place.

Effective communication from executives to employees regarding the organization's goals and strategy gives employees boundaries within which they can direct their efforts to provide relevant ideas. This is facilitated by an established clear and formal process for how employees can submit ideas for review. A formal process makes it easy for employees to share ideas and makes it easier to reward and recognize employees whose ideas are implemented. The establishment of a formal process also sends the message that employee ideas are desired and empowers employees to take an active role in improving the organization and innovation. As part of this formalization process, leaders should articulate what type of information an employee needs to provide when submitting an idea and then train employees on how to present their ideas (Desouza et al., 2009).

Organizational culture is also key to open innovation. Cultures that are open to and supportive of idea sharing make it more comfortable for employees to speak up. In addition, the culture needs to accept failure; not every idea is going to be viable or successful. An organization that penalizes employees for failure discourages idea sharing. Witnessing another employee being negatively impacted because they shared an unsuccessful idea will keep other employees from taking the risk.

A culture that fosters cooperation and provides feedback to employees also fosters ideas sharing. Study respondents discussed how working with others to develop their ideas improved their ability to articulate their ideas and better prepared them to present their ideas, leading to a more welcome reception and more likely implementation of their ideas. Leaders should also provide employees with feedback so that employees understand why or why not their idea fits the organization and so that they are better prepared to share ideas the next time. This also

prevents the perception that employees reported in the study that their ideas, when given to management, “went nowhere.”

Employees need resources to support their generation and development of ideas and providing resources should be a key part of any open innovation model because employee ideas can add value to the organization. Providing employees with support, time, and resources to develop their ideas does have costs for the organization, but the cost does not need to be excessive. Resources can be as simple as basic supplies for drawing or making rough prototypes or training to build teamwork giving employees the skills to work together to make their ideas a reality.

Incentives to share ideas and rewards for ideas that were successfully implemented are also important components of the framework for open innovation. Incentives provide impetus for employees to share ideas when they may otherwise resist. While many employees will simply share ideas for the good of the organization, depending upon the employee’s situation, there may actually be a disincentive to idea sharing, for example, if the idea sharing will lead to increased responsibility or work with no additional reward. Rewards do not need to be monetary; they can be recognition in the form of awards, formal praise, promotions, additional training, paying for education, profit-sharing, or other similar reward mechanism. The parameters for monetary rewards should be clearly established and communicated so that employees feel that they are being rewarded on an equitable basis with their peers across the organization. Monetary rewards should also be reasonably in line with the savings or revenue increases the organization benefits from based on the idea.

Good ideas can come from anywhere within an organization. In fact, someone from outside a department or area may be able to identify issues or solutions that someone who is

enmeshed daily in a situation may not. Frontline employees, in particular, can provide insight that customers or other employees may not have due to the boundary spanning nature of their position. These frontline employees typically have the most direct contact with customers as well as inside knowledge of the organization and organizational processes and procedures. Every employee has ideas to contribute and while they may not all be feasible for the organization right now, they all represent potential innovations that can add value to the organization.

Limitations and Strengths of Study

This study has several limitations and strengths. First, the study is limited in that it is attempting to generalize a set of results from a narrow sample of the organizational population. A larger sample size would have allowed for more detail and potentially other avenues of analysis. The study was descriptive and comparative only and did not address cause and effect questions or identify which variables were influencing or generating an outcome. The study does provide a snapshot of what is happening in a small group of SMEs; however, it does not tell us why Executives and Employees have the perceptions they reported, why activities do or do not occur, or what effect a change may have on individuals or the organization.

Utilizing an embedded mixed methods approach provided an opportunity to gather findings with greater depth and relevance than utilizing only one method; an advantage given the nature and complexity of the phenomenon this study sought to understand. The quantitative portion revealed frequency and how broadly phenomena are experienced while the qualitative portion helped to explore the how and why of phenomena. However, the utilization of a sequential design may have provided more detailed and richer data as more specific questions could have been developed based on responses received in the first phase of the study. The

survey was also exploratory and, while respondents were asked for additional comments and narrative responses, the researcher did not actually speak with them which would have provided additional information and context for the study. The use of, or addition of, another method of data collection may have produced different or richer results.

The study is focused on owners and employees of U.S. SMEs while a large portion of the research on open innovation in SMEs has focused on European SMEs which is a strength as it provides another perspective on open innovation activities. However, it may also be a limitation as it is not clear if any contrasting data between the results of this and previous studies based outside the U.S. may be due to differences in business environment, organizational structures, governmental involvement, or culture.

An examination of the IP addresses that were collected with the survey data in SurveyMonkey® showed a number of respondents with IP addresses outside the U.S.—although all respondents utilized for analysis answered that they both worked for a U.S. organization and had a workplace in the U.S. Being in the U.S. but having an IP address that appears to be from outside the U.S. is possible as individuals and organizations can mask their IP address for security reasons. The filter question: *Is the U.S. the country where your organization conducts the majority of their business and/or has their headquarters AND the country in which your workplace is located?* may have led to confusion on the part of participants who may not have considered both parts of the question. In the future, that question should be split into two separate questions if the goal is to ensure participants who both are working for a company headquartered in the U.S. and also living in the U.S.

The study participants were not all from the same organization so the study shows a broader range of Executive and Employee experience across many organizations. However, this

also tells a different story than if the study focused on a direct comparison of what Executives and Employees in one specific organization were perceiving.

Participants were not asked to identify what type of ideas they were contributing to their organization. Were the ideas for new process improvements within the organization or for new and improved products and services? The survey was originally designed, in part, to elicit information on how employee ideas might be contributing to new and improved product and service development within SMEs. Definitions and examples of new and improved products and services were provided as part of the survey to clarify the type of ideas the study was looking for information on. Narrative comments received from employees, however, sometimes described the submission or implementation of ideas that were process innovations and not new or improved products or services. It is unclear if respondents simply elected to provide illustrative examples in their narrative comments about their experiences sharing ideas for internal process improvements or if their idea sharing they reported engaging in was sharing ideas for process improvements rather than to create new products and services to be sold to customers.

Another limitation of the study was that participants were not asked if they were research and development employees or had a formal role in new or improved product and service development. This may skew some of the results as the tacit assumption in analysis was that Employee respondents were not involved in new and improved product and service development. Therefore, data analysis such as the percentage of employees who shared an idea with their organization may include not only non-research and development employees but those whose formal job responsibilities include research and development activities.

A final limitation of the study is that respondents were not asked the level of resources, such as personnel or financial resources, that were devoted to research and development, new

and improved product or service development, or for open innovation activities. That information would have provided information about the scale and scope of such activities within the organization which could have provided context to explain the differences in perception found in the study.

Recommendations for Further Study

The areas I recommend for further study dovetail with calls from other researchers and addresses the limitations of this study. Open innovation in SMEs may require a different structure and capabilities than open innovation in a large organization. Empirical research on organizational processes and structure and the managerial skills and competencies needed for successful open innovation is needed to provide information on what does and does not work for SMEs. There is a lack of "how-to" information available for SMEs on successfully implementing open innovation and this is an area ripe for research.

This study focused on the idea generation or ideation phase of innovation; however, innovation requires implementation and the organizational processes or activities that facilitate ideation may be very different from those that facilitate implementation and commercialization (Axtell et al., 2000). Additional research on how SMEs can better implement and commercialize ideas (Hutter et al., 2013) and on leadership and its relation to innovation implementation behavior (Michaelis et al., 2009; Mumford & Licuanan, 2004) is needed. Fostering employee idea sharing and open innovation is a positive practice; however, if the organization is unable to implement those ideas the effort of collecting and evaluating those ideas and the potential value those ideas represent may be lost.

Managing open innovation requires a specific set of management skills and competencies (van de Vrande et al., 2009); however, there is a lack of empirical research on internal

management structure and competencies needed for open innovation (Brunswicker & Vanhaverbeke, 2015; Wynarczyk et al., 2013). This study began an exploration of what activities are occurring in organizations, however, deepening the qualitative nature of the questions asked in the survey would provide a clearer picture of what is actually happening within organizations and add depth to the experiences of both Executives and Employees in SMEs in regards to open innovation and idea sharing.

Research that focuses on a specific sector such as not-for-profit organizations or a specific industry such as a service industry would also expand our knowledge of open innovation in SMEs. Given the limited empirical research on open innovation in SMEs, almost any avenue of research would add to our knowledge and support SMEs engaging in open innovation.

This study focuses on perception and culture is an important filter for perception and an interesting item for consideration. An expanded study that focused on workers living in the U.S. and working for U.S. companies would be of interest as much of the open innovation research to date has been conducted outside the U.S. National culture has an impact on the structure and operations of an organization and on individual behavior within organizations related to engaging in creativity and innovation (Williams & McGuire, 2010). Therefore, the location of the organization's' headquarters and the location of the employee are important for evaluation. There are several scenarios related to the organization's base of operations and the physical location the employee works from where national culture could impact an employee's experience which has not necessarily been addressed in the extant literature. The work context of an employee born in the U.S. and working for a U.S. organization could be very different from an employee born in and working in Asia for a U.S.-based organization.

To address a limitation of this study, future studies should include questions regarding whether the Employee respondents are tasked with research and development or new and improved product development as part of their formal job responsibilities. In addition, researchers could also ask what level of resources the organization devotes to research and development and creating new and improved product and services. This information would help to identify the scale and scope of such activities and provide additional opportunities to explore innovation in SMEs.

Future research could consider the type of innovations being created by employees. Narrative respondents frequently described the ideas they were submitting or that were implemented as process innovations or improvements to the organization's internal operations. Identifying the type of ideas that employees are sharing, frequency of implementation of those ideas, and the experience of the employee within the process based on whether the employee idea focused on an internal process innovation that would improve operations versus ideas focused on generating new or improved products would provide an interesting contrast.

In this study, respondents who self-identified as being in the role of Manager were part of the Executive role category. Further studies could separate out the Manager role and compare three role categories of Executive, Manager, and Employee to see if there are differences in perception between employees, middle management, and executive/owners. This information may help to illustrate where the disconnects in perception occur within the organization and provide additional implications for leadership and practice.

Conclusion

My personal experience indicated to me that employees have ideas about how to do their jobs more effectively, how to improve their organization, or for new or improved products or services; however, most employees need support from their organization and leadership to realize their ideas. The study results reflect that even SMEs with open innovation as a formal part of their business model are still working towards providing sufficient support for open innovation activities—including employee idea sharing within the organization.

The mean scores for the perception questions ranged from 3.31 to 4.62 on a scale of 1.0 to 6.0 reflecting that most responses fell between *somewhat disagree somewhat agree*. This indicates that the SMEs represented in the study have opportunities for improvement both in processes and how receptive they appear to be to employees for open innovation and idea sharing. Based on the responses in this survey, SMEs value the ideas that their employees contribute as they cite them as one of the greatest sources of ideas and that they are implementing employee ideas. However, that value is not being effectively communicated or demonstrated to employees.

The perception of Employees as to what their organization was doing to encourage their participation and its receptiveness to open innovation and their ideas was consistently below that of Executives. This indicates that even when an Executive thinks their SME may be doing well in one area its employees may still be perceiving that there is a lack of support or receptiveness that is preventing them from sharing ideas. Leaders need to make sure that what they think they are doing and the reality perceived by employees' match.

Employees have knowledge and relevant ideas to share and it is the leader of the organization's responsibility to set up a culture and processes that facilitates the generation,

capture, and implementation of those ideas. Research often discusses how SMEs are at a disadvantage alongside large organizations because they have a lack of internal resources which is what makes open innovation attractive for SMEs. However, there is a difference between having a lack of resources and not effectively utilizing the resources you have. SMEs have already invested in their employees so any organization not taking advantage of the knowledge and creativity of those employees is simply flushing their assets down the drain.

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Appendix: Survey

Academic Study - Ideas

Dear Participant,

Thank you for your interest in this research effort! As an Antioch University student enrolled in the PhD in Leadership and Change program, I am seeking your input for my research on idea development in organizations.

Your participation will contribute to the understanding of how idea generation and product and service development in organizations take place and what activities within the organization support idea development.

Workers will first be asked to complete four pre-screening questions which will take 1-2 minutes. Participants completing the pre-qualifying questions on MTurk will receive $0.05.

Workers who qualify for and finish the full survey -- which will take about 10 minutes to complete -- will receive a bonus of $0.95.

There are minimal, if any, risks from participating in this survey. No personally identifiable information will be associated with your responses in any reports of these data; survey data will only be reported in aggregate. If you find a question confusing or unclear, you can answer it to the best of your knowledge.

MTurk worker IDs will not be shared with anyone outside of the research team, will be removed from the data set, and will not be linked to your survey responses. Note that Amazon.com has stated that the MTurk platform is NOT meant to support participant anonymity. MTurk worker IDs are linked to Amazon.com public profiles. Amazon.com may disclose worker information. Additionally, worker information may be available to others (who submit a request) for tax reporting purposes. MTurk worker IDs will only be collected for the purposes of distributing compensation and will not be associated with survey responses.

This survey has been approved by the Antioch University Institutional Review Board. Questions about your rights as a research participate may be directed to Dr. Lisa Kreeger, Chair of the Antioch University Institutional Review Board, at lkreeger@antioch.edu. Questions about the survey, itself, should be directed to Bethany Davidson at bdavidson@antioch.edu.

By clicking "Next" below, you confirm that you are at least 18 years old, have read and understand this survey introduction, and agree to participate in this research study. Please note that this survey is voluntary and for any reason and at any time during the process, you may elect to exit the survey.

In advance, I thank you for your participation and contribution to this research.

Sincerely,

Bethany Davidson

Academic Study - Ideas

* 1. Are you currently employed in or the owner of a for-profit business?

- ◯ Yes
- ◯ No

* 2. Is the U.S. the country where your organization conducts the majority of their business and/or has their headquarters AND the country in which your workplace is located?

- ◯ Yes
- ◯ No

* 3. Does this organization sell directly to the end customer? The customer could be another business.

- ◯ Yes
- ◯ No

* 4. Please identify with your best estimate how many employees currently work in your organization?

- ◯ 1-9
- ◯ 10-49
- ◯ 50-249
- ◯ 250-499
- ◯ 500-999
- ◯ 1,000+

Academic Study - Ideas

* 5. Do you, as part of your job responsibilities, directly interact with customers (those who actually purchase products or services)?

- ◯ Yes
- ◯ No

6. Does the organization you work for **have internal staff that do research and development** or new product development as part of their work assignment?

- ◯ Yes
- ◯ No
- ◯ Don't Know/Not Sure
- ◯ Other (please describe)

* 7. Which of the choices below best describes your role in your organization?

- ◯ Owner
- ◯ Partner
- ◯ Executive (C-Suite, Vice President, Director)
- ◯ Manager
- ◯ Supervisor or Project/Team Leader
- ◯ Non-Managerial Employee
- ◯ Other

Academic Study - Ideas

* 8. Has your organization developed any **new products or services or begun selling any improved products or services in the last few years?**

- ◯ Yes
- ◯ No
- ◯ Don't Know/Not Sure

9. If your answer was yes, what type of products or services has your organization created or improved?

Academic Study - Ideas

* 10. Thinking about how your organization finds ideas for **new or improved products and services**, how often do the ideas come from each of the following groups?

	Never	Rarely	Sometimes	Fairly Often	Most of the TIme
a. Entrepreneur/Owner	○	○	○	○	○
b. Executives	○	○	○	○	○
c. Employee	○	○	○	○	○
d. Customers	○	○	○	○	○
e. Crowdsourcing (e.g. social media posts, blog comments, Yelp reviews)	○	○	○	○	○
f. Online Idea/Innovation Platform (i.e. IdeaConnection or Innocentive)	○	○	○	○	○
g. Suppliers	○	○	○	○	○
h. Universities	○	○	○	○	○
i. Consultants	○	○	○	○	○
j. Competitors	○	○	○	○	○
k. Public or Governmental Organizations	○	○	○	○	○

Academic Study - Ideas

* 11. Thinking about how things work in your organization and employee idea sharing activities, please indicate how strongly you agree or disagree with the following statements.

My organization...

	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
a. ...has a **formal process** for employees to submit their ideas for new products and services (online submission form, written process) that is clearly communicated to employees	◯	◯	◯	◯	◯	◯
b. ...has an **informal process** for employees to share their ideas for new products and services	◯	◯	◯	◯	◯	◯
c. ...communicates about and solicits ideas from employees to solve problems within the organization	◯	◯	◯	◯	◯	◯
d. ...empowers employees to share their ideas to innovate products and services	◯	◯	◯	◯	◯	◯
e. ...provides employees with time to work on ideas outside of their normal job duties	◯	◯	◯	◯	◯	◯
f. ...provides training to employees to improve their ability to generate and implement ideas	◯	◯	◯	◯	◯	◯
g. ...provides resources for employees to pursue ideas	◯	◯	◯	◯	◯	◯
h. ...provides incentives for employees to share ideas	◯	◯	◯	◯	◯	◯
i. ...recognizes and rewards employees who contribute ideas that are implemented	◯	◯	◯	◯	◯	◯
j. ...accepts failure when testing new ideas for products and services	◯	◯	◯	◯	◯	◯

Academic Study - Ideas

* 12. Thinking about **how things work in your organization and employee idea sharing activities**, please indicate how strongly you agree or disagree with the following statements.

	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
a. Top management communicates a shared vision for the organization to employees	○	○	○	○	○	○
b. Top management communicates the organization's strategy to employees	○	○	○	○	○	○
c. Employees are interested in sharing ideas to improve our products and/or services	○	○	○	○	○	○
d. Employees have good quality ideas to share	○	○	○	○	○	○
e. Employees have sufficient knowledge of the market and competitors to provide relevant ideas	○	○	○	○	○	○
f. Employees have sufficient knowledge of customers and customer needs to provide relevant ideas	○	○	○	○	○	○
g. In my experience, once an idea is submitted an employee receives feedback on the idea	○	○	○	○	○	○
h. Employee ideas shared with the organization are often implemented	○	○	○	○	○	○
i. Ownership of an idea (intellectual property rights) is a concern when employees share ideas	○	○	○	○	○	○
m. Other	○	○	○	○	○	○

What, if any, other thoughts do you have about how idea sharing works in your organization?

Academic Study - Ideas

Inbound open innovation in organizations can be defined as an organization utilizing resources other than a formal internal research and development process to generate ideas for new or improved products and services. For example, outside ideas can come from: customers, suppliers, crowdsourcing (e.g. social media posts), universities, and government entities, as well as employees who are not typically involved in research and new product development.

* 13. Based on the definition above, **how frequently** does your organization **engage in inbound open innovation activities** when **creating new or improving existing products or services?**

- ◯ Never
- ◯ Rarely
- ◯ Sometimes
- ◯ Fairly Often
- ◯ Very Often

Academic Study - Ideas

* 14. Thinking about **what motivates your organization to engage in open innovation**, how strongly do you disagree or agree that each of the following factors is a motivation for your organization to engage in open innovation?

	Strongly disagree	Disagree	Disagree somewhat	Agree somewhat	Agree	Strongly agree
a. To identify new business opportunities	○	○	○	○	○	○
b. To reduce the cost of new product or service development	○	○	○	○	○	○
c. To increase efficiency	○	○	○	○	○	○
d. To solve problems	○	○	○	○	○	○
e. To keep up with competition	○	○	○	○	○	○
f. To develop products or services that the organization cannot develop with its own resources	○	○	○	○	○	○
g. To optimize use of non-research and development employee talents, knowledge, and initiative	○	○	○	○	○	○
h. To Involve non-research and development employees in product development and improvement	○	○	○	○	○	○
i. Other	○	○	○	○	○	○

What, if any, other factors motivate your organization to engage in open innovation?

Academic Study - Ideas

* 15. Based on the definition of open innovation and your answer to previous questions,**do you consider open innovation to be a formal or informal part of your organization's business model**?

- Formal
- Informal
- Not a part of the organization's business model

Academic Study - Ideas

* 16. Thinking about **how things work in your organization and employee idea sharing activities**, please indicate how strongly you agree or disagree with the following statements.

My organization...

	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
a. ...has a **formal process** for employees to submit their ideas for new or improved products and services (e.g. online submission form, suggestion box, written process) that is clearly communicated to employees	○	○	○	○	○	○
b. ...has an **informal process** for employees to share their ideas for new or improved products and services	○	○	○	○	○	○
c. ...communicates about and solicits ideas from employees to solve problems within the organization	○	○	○	○	○	○
d. ...empowers employees to share their ideas to innovate products and services	○	○	○	○	○	○
e. ...provides employees with time to work on ideas outside of their normal job duties	○	○	○	○	○	○
f. ...provides training to employees to improve their ability to generate and implement ideas	○	○	○	○	○	○
g. ...provides resources for employees to pursue ideas	○	○	○	○	○	○
h. ...provides incentives for employees to share ideas	○	○	○	○	○	○
i. ...recognizes and rewards employees who contribute ideas that are implemented	○	○	○	○	○	○
j. ...accepts failure when testing new ideas for products and services	○	○	○	○	○	○

Academic Study - Ideas

* 17. Thinking about **how things work in your organization and employee idea sharing activities**, please indicate how strongly you agree or disagree with the following statements.

	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
a. Top management communicates a shared vision for the organization to employees	○	○	○	○	○	○
b. Top management communicates the organization's strategy to employees	○	○	○	○	○	○
c. Employees are interested in sharing ideas to improve our products and/or services	○	○	○	○	○	○
d. Employees have good quality ideas to share	○	○	○	○	○	○
e. Employees have sufficient knowledge of the market and competitors to provide relevant ideas	○	○	○	○	○	○
f. Employees have sufficient knowledge of customers and customer needs to provide relevant ideas	○	○	○	○	○	○
g. In my experience, once an idea is submitted an employee receives feedback on the idea	○	○	○	○	○	○
h. Employee ideas shared with the organization are often implemented	○	○	○	○	○	○
i. Ownership of an idea (intellectual property rights) is a concern when employees share ideas	○	○	○	○	○	○

What, if any, other thoughts do you have about how idea sharing works in your organization?

Academic Study - Ideas

Inbound open innovation in organizations can be defined as an organization utilizing resources other than a formal internal research and development process to generate ideas for new or improved products and services. For example, outside ideas can come from: customers, suppliers, crowdsourcing (e.g. social media posts), universities, and government entities, as well as employees who are not typically involved in research and new product development.

* 18. Based on the definition above, **how frequently** does your organization **engage in inbound open innovation activities** when **creating new or improving existing products or services?**

- ◯ Never
- ◯ Rarely
- ◯ Sometimes
- ◯ Fairly Often
- ◯ Very Often
- ◯ Don't Know/Not Sure

Academic Study - Ideas

* 19. Thinking back over the last few years, was there a time when **you personally shared an idea** for a **new or improved product or service** with your organization?

- Yes
- No

20. If **you personally shared your idea** for a **new or improved product or service** with your organization, please describe what happened. For example, who did you share the idea with, how was the idea received, did you receive feedback, was the idea implemented, etc.?

Academic Study - Ideas

* 21. Thinking back over the last few years, was there a time you are aware of when a **fellow employee shared an idea** for a **new or improved product or service** with your organization?

- Yes
- No
- Don't Know / Not Sure

22. If you are aware of a **fellow employee sharing an idea** for a **new or improved product or service** with your organization, please describe what happened. For example, who did they share their idea with, how was the idea received, did they receive feedback, was the idea implemented, etc.?

Academic Study - Ideas

23. Are you currently operating or working in your organization full-time or part-time?

- ◯ Full-time
- ◯ Part-time

24. Which of the following best describes your organization?

- ◯ For-Profit Direct to Customer (Customer could be another organization)
- ◯ For-Profit Wholesaler or Distributor
- ◯ Other (please specify)

25. Please select the the choice that best reflects the industry or core business of your organization:

- ◯ Manufacturing
- ◯ Retail
- ◯ Consumer Products
- ◯ Healthcare
- ◯ Hospitality and Tourism/Travel
- ◯ Professional, Scientific, and Business Services (Accounting, Legal, Consulting, Engineering, etc.)
- ◯ Financial Services/Banking
- ◯ IT/Technology
- ◯ Restaurant/Food Service
- ◯ Arts/Entertainment/Sports
- ◯ Personal and Home Services
- ◯ Education
- ◯ Agriculture/Forestry
- ◯ Other Industry (please specify)

26. What is your gender?

- ◯ Female
- ◯ Male
- ◯ Transgender
- ◯ Prefer not to answer

Academic Study - Ideas

* 27. Please enter your MTurk Worker ID to receive your task completion code

Academic Study - Ideas

* 28.

A 5.0%	Enter the following code as a completion code in the MTurk task: 3L3G2JD4
B 5.0%	Enter the following code as a completion code in the MTurk task: 3WJIVXFA
C 5.0%	Enter the following code as a completion code in the MTurk task: 3PBHTZGC
D 5.0%	Enter the following code as a completion code in the MTurk task: 3NODQKEX
E 5.0%	Enter the following code as a completion code in the MTurk task: 3ILVFR54
F 5.0%	Enter the following code as a completion code in the MTurk task: 3R6JF80V
G 5.0%	Enter the following code as a completion code in the MTurk task: 3J4101CC
H 5.0%	Enter the following code as a completion code in the MTurk task: 3RTDWW07
I 5.0%	Enter the following code as a completion code in the MTurk task: 33JOEDRX
J 5.0%	Enter the following code as a completion code in the MTurk task: 3MCDZL2K
K 5.0%	Enter the following code as a completion code in the MTurk task: 3BBKC0S7
L 5.0%	Enter the following code as a completion code in the MTurk task: 3QA8HN9V
M 5.0%	Enter the following code as a completion code in the MTurk task: 36GZFWT4
N 5.0%	Enter the following code as a completion code in the MTurk task: 3AZ050NE
O 5.0%	Enter the following code as a completion code in the MTurk task: 38PSLQ9I
P 5.0%	Enter the following code as a completion code in the MTurk task: 3BMAQUHA
Q 5.0%	Enter the following code as a completion code in the MTurk task: 3WHY4FCQ
R 5.0%	Enter the following code as a completion code in the MTurk task: 35H9WKOI
S 5.0%	Enter the following code as a completion code in the MTurk task: 35NH95IA
T 5.0%	Enter the following code as a completion code in the MTurk task: 3FLTUFUV

◯ Yes I have entered that code on the MTurk website